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Number 2.

AUGUST, 1900.

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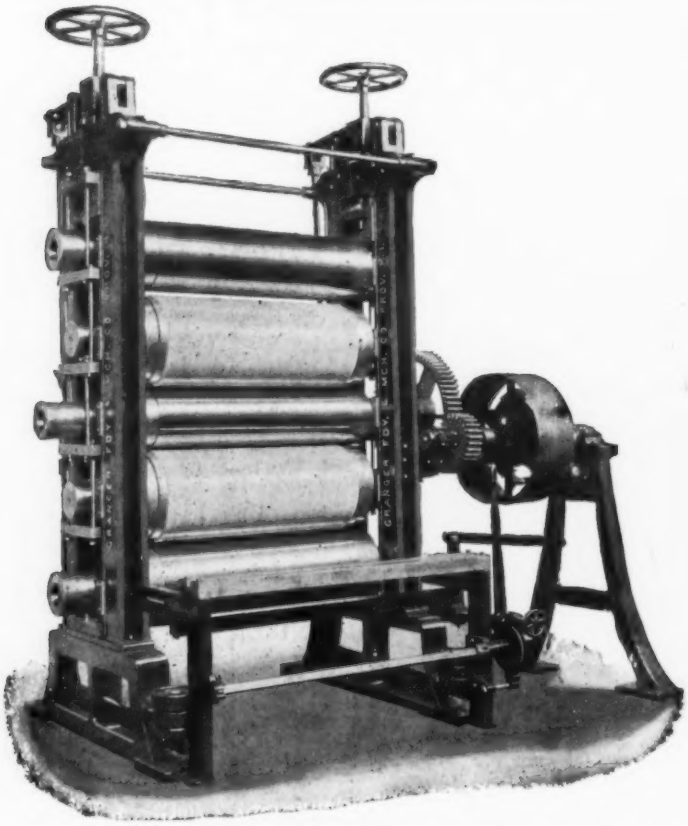

CALENDERS, MANGLES AND ROLLS.

TENTERING MACHINES,
MERCERIZING MACHINES.

Granger Foundry and Machine Co.

PROVIDENCE, R. I.

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MACHINERY,

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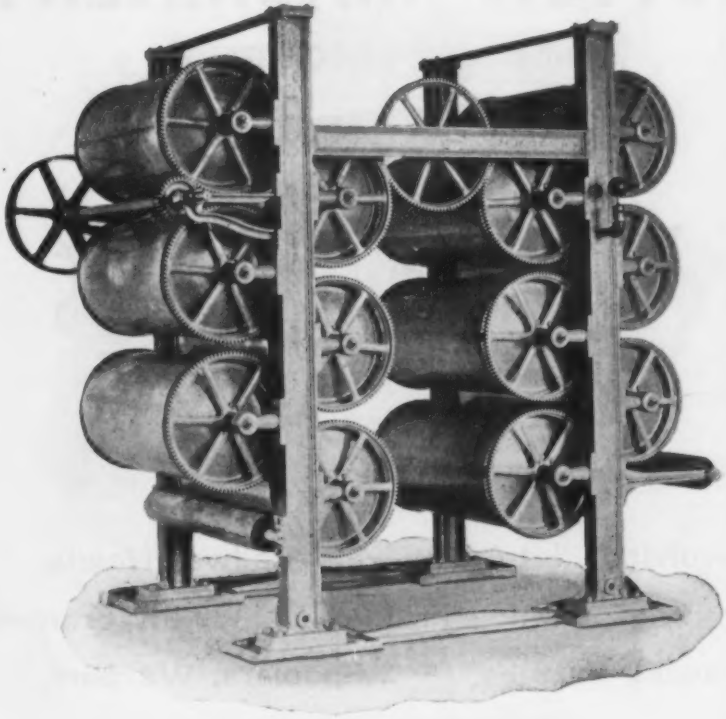

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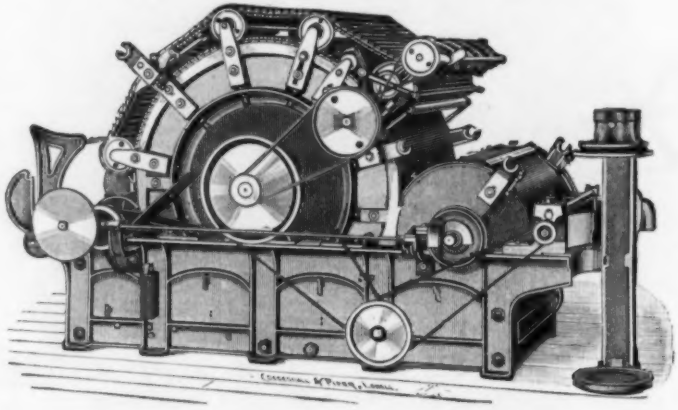

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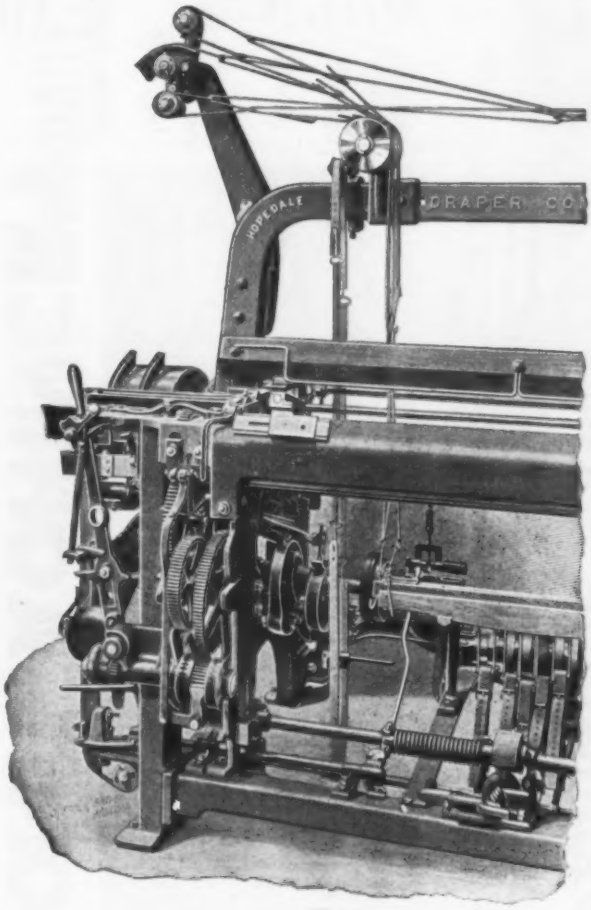

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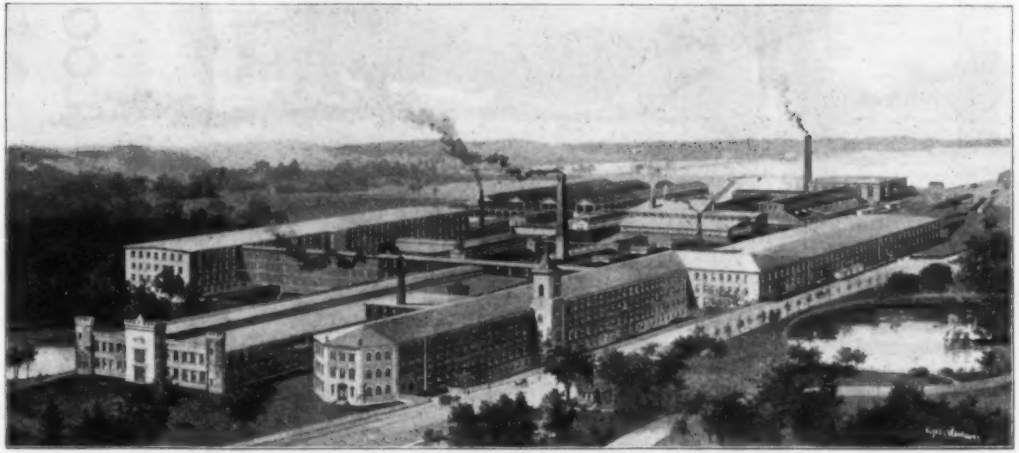

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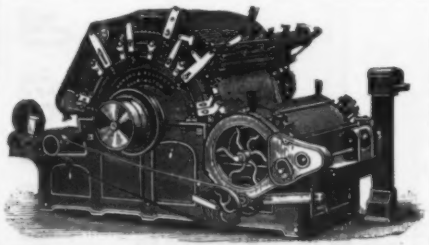

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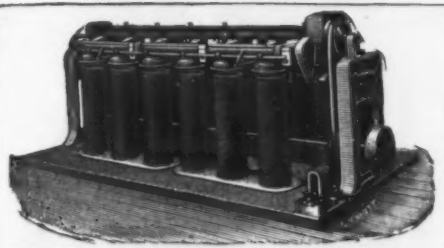

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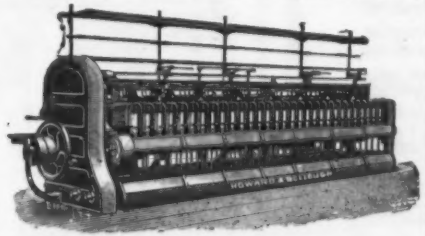

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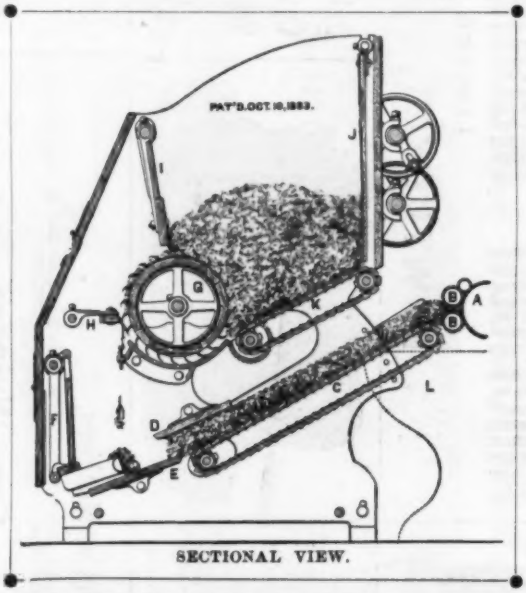

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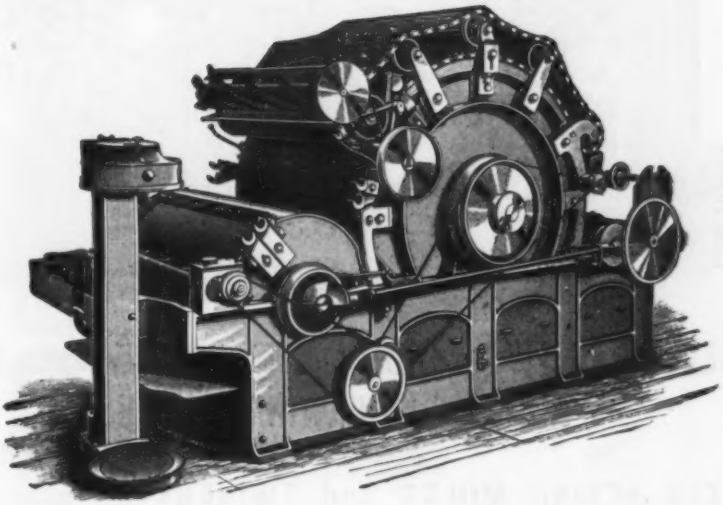

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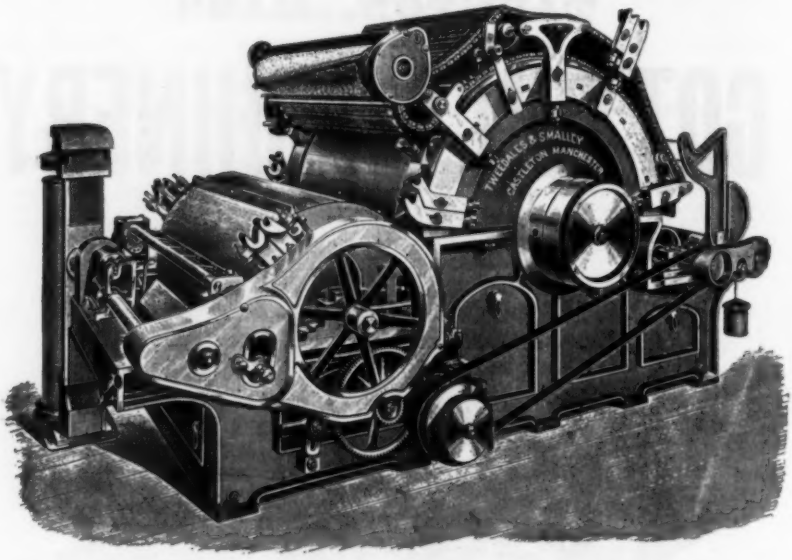

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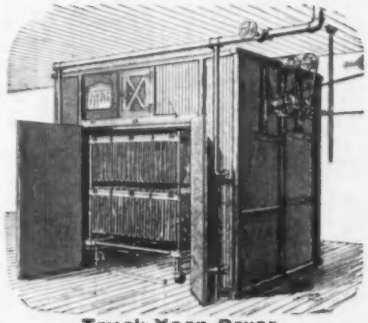

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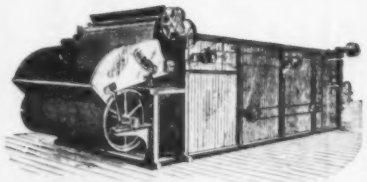

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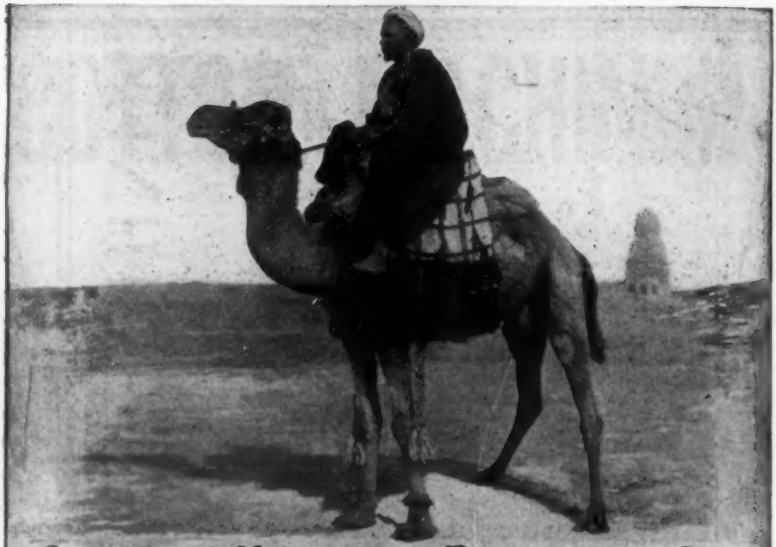

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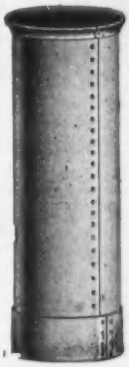

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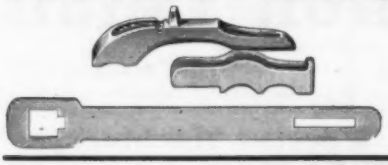

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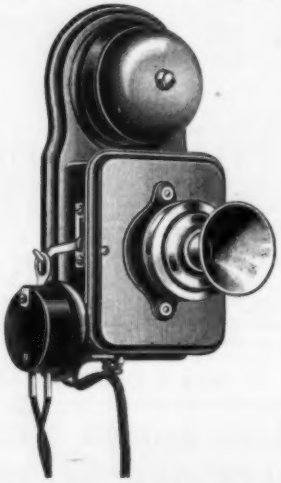

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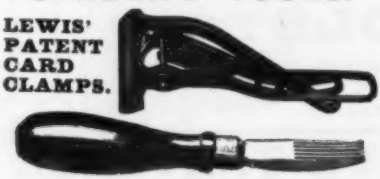

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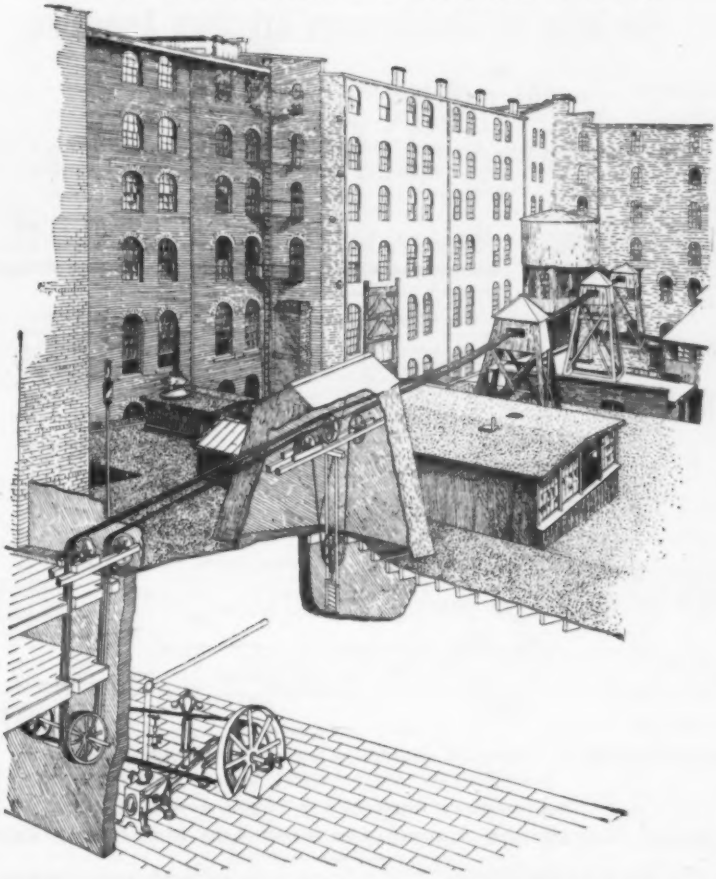

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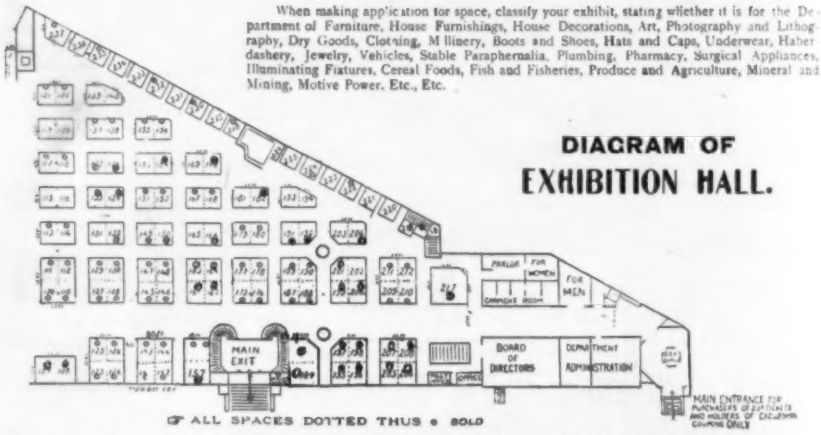

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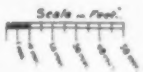

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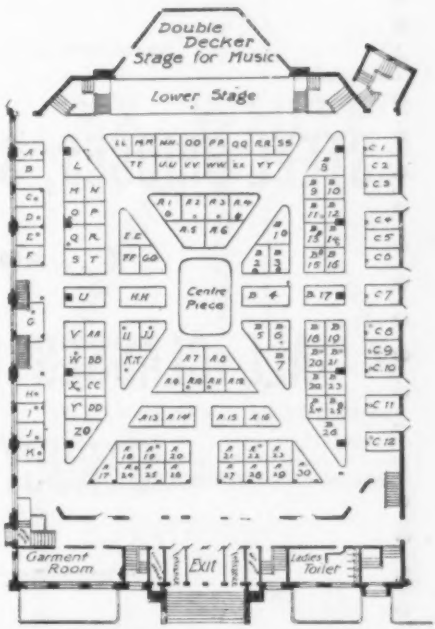

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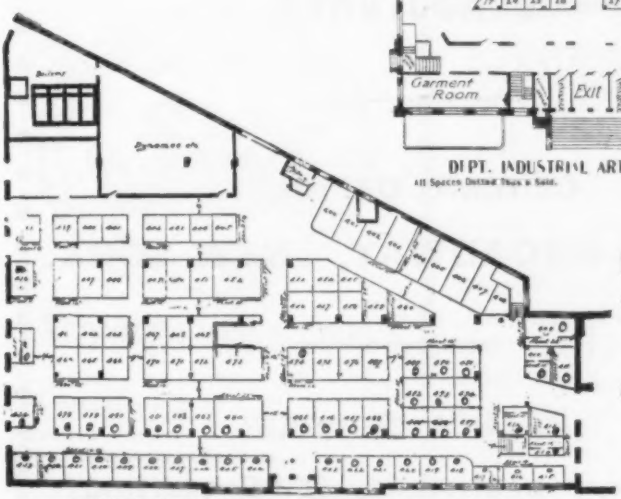

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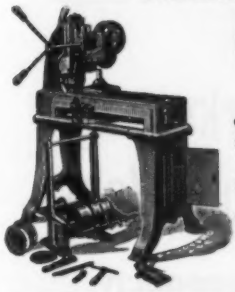

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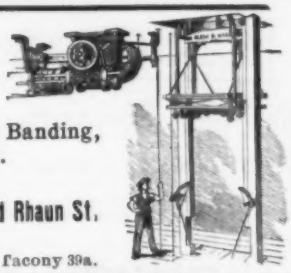

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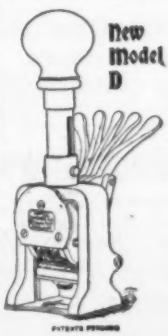

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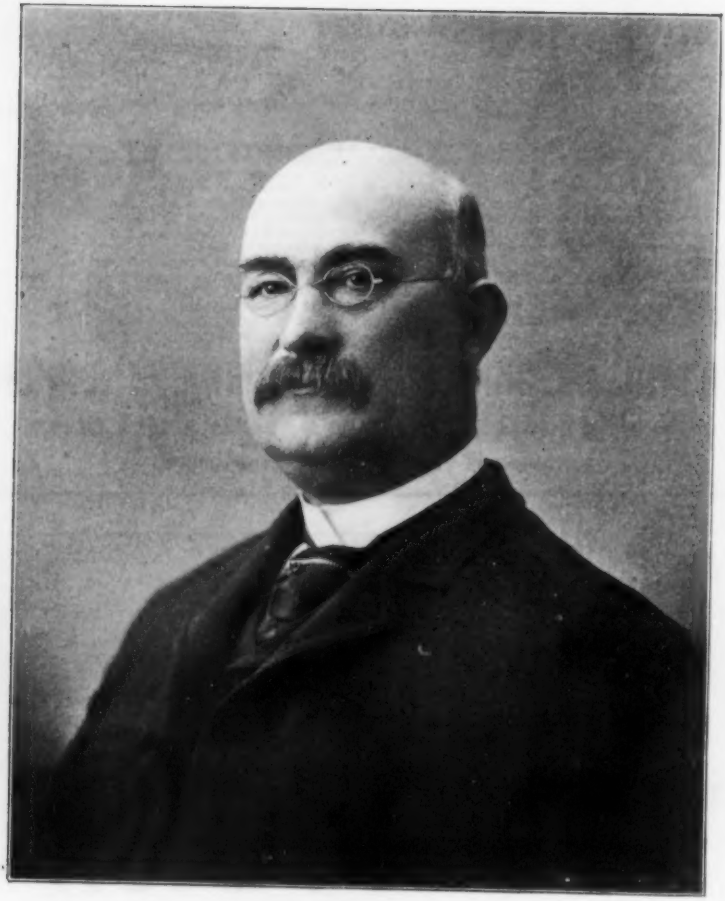
"A LITTLE BLUE-BOOK ON ROPE TRANSMISSION."
SECOND EDITION—AUGMENTED.



ALVIN S. LYON.

TEXTILE WORLD.

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Alvin S. Lyon.

The subject of this sketch, at present agent of the Lowell division of the Bigelow Carpet Company, was born in Methuen, Mass., in 1843. At the age of nine years, he moved to Lawrence, where he lived until twenty-seven years of age. Here he obtained his education in the Lawrence schools, and then entered the employ of the Washington Mills, at the age of fifteen. The first two years were passed in the wool sorting department, and then he worked a year in the card room. At the end of three years in the Washington Mills, he entered the employ of the Atlantic Cotton Mills, where he worked for seven years in the weaving, carding and spinning rooms, and then worked two years for the Pacific Mills.

Up to this time, Mr. Lyon had been an ordinary worker in the mill, but had carefully studied the details of the business, and become proficient in many of the departments of the mill. He had acquired a fund of information, and an experience which fitted him for the responsible positions which he afterwards occupied.

His first experience in charge of manufacturing was obtained at the quilt mills of the Beaman Mills Company, West Boylston, Mass. He next occupied a similar position at the Bates Quilt Mill of Lewiston, Me. Very soon after this came a still more favorable offer from the Atlantic Delaine Mills, at Olneyville, R. I., which he accepted. Here he remained for nearly four years, when he went to the Merchants Mill, at Fall River. Mr Lyon had been rapidly promoted, and by his close application to mill management and the study of manufacturing, had become thoroughly acquainted with the manufacture of both cotton and woolen goods. His knowledge and ability as a shrewd manager were well known, and the Crescent Mills, a very successful corporation of Fall River at that time, offered him the superintendency of their mills.

His next promotion was to a similar position in the Durfee Mills, then the largest mill in Fall River. Mr. Lyon remained with the Durfee Mill until 1884, when he was appointed agent of the Lowell Manufacturing Company, which was one of the largest carpet mills in the country. On January last, this concern consolidated with the Bigelow Carpet Company of Clinton, Mass. Until the Lowell Manufacturing Company consolidated with the Bigelow Company, A. T. Lyman was treasurer, and Mr. Lyon, agent, and he, with Mr. Lyon as agent, have rebuilt most of the mills, and equipped them with modern machinery, and the goods manufactured are noted for their high standard of excellency.

Mr. Lyon has been the inventor of many profitable inventions; among them being machines for skein dyeing and wool mixing. He is a director in Lowell Banks and the Kitson Machine Company. He has taken a great interest in the Lowell Textile School, and is now very much interested in the plans for the new building.

THE CHINESE QUESTION.

The effects of the collision between China and the rest of the world are likely to affect directly or indirectly every country and every industry in existence.

The Chinese foreign trade fell off at once upon the breaking out of hostilities, and reports from all quarters indicate that, as the situation has become more serious, trade with China in all lines has come to a standstill.

China imports no textiles of any account outside of cotton goods. Woolen fabrics are not used by them to any extent. Even in the colder latitudes of China cotton remains the chief article of wearing apparel. It is consequently the cotton industry which is most affected by the disturbance.

The value of cotton goods imported from all countries into China in 1894 was $44,289,000; 1895, $39,805,000; 1896, $64,186,830; 1897, $61,357,140; 1898, $54,099,746; of these goods the United States sent 6 4/10 per cent. in 1894; 4 3/10 per cent. in 1895; 6 per cent. in 1896; 12 1/10 per cent. in 1897 and 9 6/10 per cent. 1898. Last year we sold to China $9,823,253 worth of cotton goods, or 9 4/10 per cent. of the total Chinese imports of these goods, as compared with $5,195,845 in 1898. 1899 was the banner year in cotton goods exported to China.

While our trade showed a remarkable increase last year, it is, however, still small as compared with the cotton goods manufactured and consumed in the United States.

We can safely estimate that our mills produce annually over $300,000,000 dollars worth of woven cottons. This means that our China trade in cottons in 1899 was but 3 per cent. of our total product.

The loss of this nine millions of dollars worth of business is a serious matter, especially to the mills whose product has found a market in China, but, viewed in its true perspective, it does not appear of such importance, as to seriously affect our cotton manufacturing industry.

The cotton looms of England and the Continent, which have supplied over 90 per cent. of the cotton cloth bought by the Chinese, will be most affected by the loss of this trade, and American mills will continue to find a market for their goods at home, and in other countries until the troubles are over.

The duration of the war now in progress is problematical, but there can be little doubt as to the ultimate result of a contest with the great world powers combined against China.

With the restoration of order, the slow work of opening up the markets of China to the outside world will be resumed. Here is a population of 400,000,000 clothed in cotton cloth. We have no means of measuring their probable wants in this line. Trade with the interior of China is now handicapped by lack of transportation. The products of Chinese industry can now be carried to the world's markets, and the goods from outside points can reach the interior of China only at a cost which prohibits business.

Wherever railroads have been built in China, trade undreamt of, has sprung up as by magic, and this work of providing transportation for the Chinese has hardly been begun. It will take many years to bring this vast nation into quick communication with outside markets. The probable size of the outlet for cottons in China, when that time comes, staggers the imagination.

The people of the United States consumed in 1890 cotton goods to the value of $3.17 per capita. Assuming that the Chinese population clothed wholly in cotton, will use one-half as much cotton cloth per capita, as our people, clothed only partially in cotton, now consume, we have a consumption of $634,000,000 worth of these goods per annum in China.

At the 1890 rate of production in the United States this amount of goods would require over 46,000,000 cotton spindles. It is estimated that there are now about 105,000,000 spindles in

operation throughout the world, of which the United States has 21,000,000. More than twice the number of cotton spindles now in the United States will be required to clothe 400,000,000 Chinamen.

With the preservation of the open door this trade will go where the goods can be bought for the least money.

The increased demand for raw material will be supplied in great measure by the cotton fields of our own South. Nature has assured us of that. This raw material will be spun and woven where that work can be done the cheapest.

Is it reasonable to suppose that such a people as the Chinese will buy what they themselves can make? China holds uncounted millions of the most industrious people on earth, distinguished by an absence of nerves, living on a few cents' worth of rice per day, and willing to work 14 hours out of the 24; they are intelligent, frugal, obedient, unmindful of comfort, sharp in making a bargain.

Will such a race, eager to work for from 3 cents to 20 cents per day, be content to have their cotton goods made for them by workers who demand from $8 to $12 per week? Will not such a race of people manufacture for others, as well as themselves? Sometimes the thought occurs that "the open door" can swing both ways.

A FANCY FLANNEL CHAT.

There is nothing new in the construction or design of these goods. Their prominence is due wholly to fashion, which demanded some substitute for the summer fabrics of recent years, and found it in this flannel fabric.

It made its first appearance here in low priced suits purchased by American tourists in Europe. It is now the rage, and bids fair to continue so for at least another season. We wish we could also say that its manufacture promises a profit to our mills. It is simply a very light weight fancy woolen cassimere, and as such is adapted to a class of our mills, which has been left in the lurch by the popularity of worsteds, and whose owners have been quick to seize upon this fabric to employ their machinery.

Shoddy and short waste cannot be used in this cloth, owing to its light weight and the comparatively fine count, to which the yarn must be spun. Being a summer fabric, it must be light, the lighter the better, if a fairly firm handle and sufficient strength can at same time be retained.

The bulk of the goods, which have so far appeared on the market, have been made of a fine medium territory wool, and with such fabrics the only way of reducing cost of stock is to spin fine, and reduce weight. If the popularity of this cloth continues, we may expect to see the market flooded with flannel suitings adulterated in the only way possible, that is, by the admixture of cotton. A few lines of this character have already appeared.

In the illustrations are shown four of the leading makes last season. The cost estimates of these goods are based upon fine medium wool at 50 cents per pound, the present rate of wages, and the average production of a well-organized woolen mill well equipped for this grade of goods, and running to its fullest capacity.

These figures are not to be taken as the cost of the goods in the mills named, as no means exist for us to obtain the statistics of their cost, but we feel confident that, with wool at 50 cents per pound, wages where they are today, and in the present state of the art of woolen manufacturing, no mill can make these goods for less than the estimate given, although there are plenty of mills that will by various means make them cost more than our estimates.

The selling prices are subject to the usual discount, commission and charges. These items combined can

in most cases be safely estimated at 20 per cent. of gross selling price.

Sample No. 289 is a fabric sold by Fleitman & Co. for $1.00, netting the mill 80 cents per 6/4 yard. It weighs 12 ounces per 6/4 yard, is woven with a four-leaf twill, and as in the case of the other fabrics, is fulled very little.

There are in the finished goods 48 ends of warp, and 43 ends of filling, and the size of yarn will average about 4½ runs, that is in the grease.

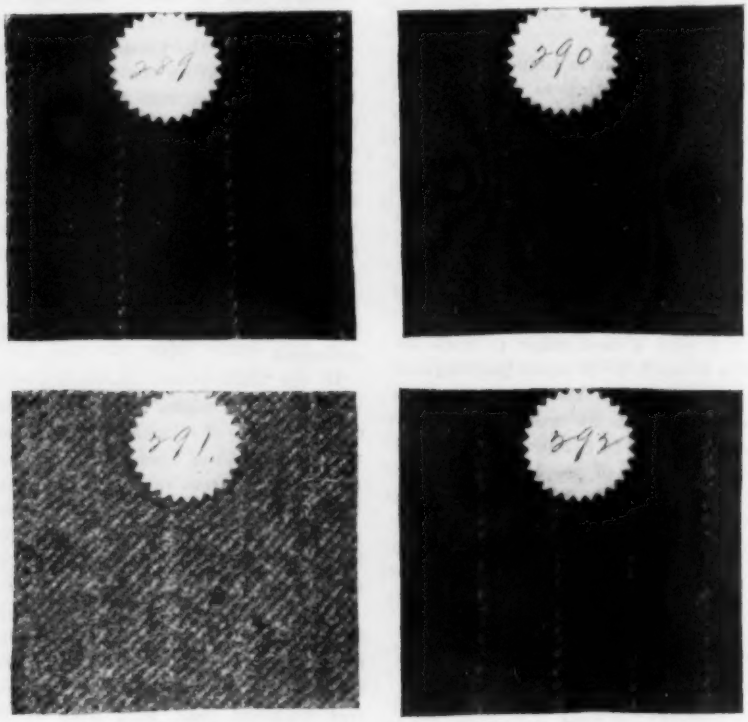
The cost estimate per 6/4 yard is:—stock, .515; labor, .234; expense, .102; total, .851, or over 5 cents per yard more than was received for the goods last season.

No. 290, said to be made at the Sawyer Mill, and sold by the American Woolen Co. for $1.30, nets the combine $1.04 per yard. This fabric weighs 13 ounces per 6/4 yard, is woven with a four-leaf twill, and is striped with silk, which adds possibly 5 cents per yard to the cost. The finished goods have 56 threads of warp and 60 threads of filling per inch, the yarn being spun 4 5/8 runs. Our estimate of cost for this cloth being:—stock, including silk, .61; labor, .284; expense, .122; total, 1.016, or giving the manufacturer on last year's prices and this year's cost about 2½ cents per yard to repay him for his risk and labor.

No. 291 is another product of the American Woolen Co., this one said to be made in the Assabet Mill, and sold for 1.12½, netting 90 cents per yard. The goods weigh 12½ ounces per 6/4 yard, and are woven with a four-leaf twill. There are 55 threads of warp and 53 of filling per inch of finished goods, the yarn having been spun to 4 7/8 runs.

The cost estimate is as follows:—stock, .538; labor, .264; expense, .111; total, .913, or 1.3 cents per yard more than the goods sold for last season according to quotations.

No. 292, sold by Parker, Wilder & Co.



FOUR OF THE LEADING MAKES OF ALL WOOL FANCY FLANNEL SUITINGS.

for 85 cents per yard, and said to be made in the Cocheco Woolen Mill, weighs but 10 ounces per 6/4 yard. It is practically the fancy wool cassimere on which this and other dress goods mills put their machinery when the demand for soft wool dress goods slackened some years ago.

This class of mills are peculiarly well adapted as regards equipment and organization to produce such a fabric as this flannel suiting at a low cost, and by reason of their experience in making very light woolens they can reduce the cost for wool to its lowest terms by the lighter weight of their goods.

The sample shown as the Cocheco fabric contains 51 warp and 41 filling threads per inch finished, and the yarn is spun to 5¼ runs. The estimate of cost per 6/4 yard is:—for stock, .432; labor, .218; expense, .092; total, .742, or 6.2 cents margin.

As already stated these estimates are based on fine medium wool selling at 50 cents per pound, and the selling prices of the goods given are those of last season. This season's prices at this writing have not yet been fixed. Last year, when orders were taken at prices quoted, this grade of wool was selling at about 45 cents per pound, and most mills were heavily stocked with wool purchased around these figures. An examination of the chart at head of our wool market report will quickly show what fine medium wool could have been purchased for, previous to the opening of light weights in July, 1899, and the fine medium line, carried in this chart up to the end of July, 1900, tells the story of today's market.

The cost and selling prices of these goods, which we have given, shows, not that the maker necessarily lost or made the differences, but that this would be the condition confronting him today with wool purchased at today's prices, and they forcibly present the necessity for higher prices for this season's goods, or for cheaper raw material, or else some modification of the fabric.

One factor in the manufacture and sale of these goods should not be overlooked, and that is the stock of odd goods left over at end of season to be closed out at a heavy discount. This item cannot be included in any cost estimate but in the case of fancy goods such as these, it can never be eliminated, and often means a heavy loss to the mill.

The advance, varying from 5 to 10 per cent., at which light weight goods have been opened, even if fully realized in the prices of flannel suiting, makes it difficult for the manufacturer to get a new dollar for an old one, and is an additional reason for the use of wool substitutes.

FLANNEL STRIPES.

For a long time the serge cloth suit was the one in greatest demand for wear during the hot summer months, but the desire for something new has brought into prominence the flannel suiting fabric, and as plain flannels are not very attractive and not as snappy as fancy ones, the fabric had to be striped with color, which is about the only way it can be ornamented. Some few lines were shown a year ago which were overplaided, but they did not sell, the demand being for the stripe, on account of the single overplaid on the plain ground looking too blocky. The flannel stripes first made their appearance the last light weight season; a few had been sold before that, but the demand did not amount to anything until that season and, as it is a light weight fabric simply, it was not made in heavy weight lines, and the manufacturers, who intend to produce same, have only the basis of the fabrics of a year ago to work on.

In another column of this issue this fabric is considered from a manufacturer's standpoint, and the results of careful analyses and estimates of costs of the leading lines are given.

Some time ago the consensus of opinion was, that the present light weight season would open with prices

ten or fifteen per cent. higher than last year's opening prices, but the last few weeks have changed this idea, and many now know that the advance will be very small in many cases, and nothing in others.

The line of stripes which had the largest sale a year ago were those shown by the American Woolen Co. One line made in the Assabet Mill was sold at $1.12½ per yard, and being heavier than the majority of fabrics, it was an excellent one, on this account.

The Sawyer fabric also, sold by the American Woolen Co., had the same thing in its favor, and weighed about thirteen ounces, and while the demand is for these flannels to be light, it is also necessary that they have weight enough to give the fabric a body. The Sawyer grade of flannels was also striped with silk, which in the various colors makes a clearer stripe than the woolen thread.

Brigham, Lawrie & Drowne also had a popular line at $1.00, and the fabric was an excellent one, although about an ounce lighter than the American Woolen Co.'s goods at the same price.

Fleitman & Co. had a line of flannels which opened at 90 cents and were a clean, bright fabric, which sold well, so that the price was advanced to $1.00, and the reason for this advance will be seen in the table of cost estimate which appears elsewhere in this issue.

The cheapest flannel of really good quality was the "Cocheco" line sold by Parker, Wilder & Co., at 85 cents; this fabric was only 10 ounces in weight, but had the advantage of being firm.

These five fabrics, while not being all the makes in the market, are the principal ones, and samples of same are shown in the illustrations. The stripes with different colors alternating are the ones which will sell best, and the olive grounds are in greatest demand, the width of stripe being illustrated here.

The plain blue goods of a decided light tone are good, and the shade of the blue should be on the order of the electric serge only slightly darker. The stripes can vary in color from white to dark green and dark red.

The flannel fabric has had a large sale and will also have it again this season.

Some few lines of these stripes have already been opened, and many of them are too high priced for the buyer to touch, for this is a season when they will be wanted in the cheaper goods, having had their run in the higher priced ones a season ago.

—Wool weighing 10,784,459 pounds was imported into the United States in June, 1900, as compared with 8,416,404 pounds in June, 1899. The figures of wool imports for the year ending June, 1900, are 155,918,455 pounds, compared with 76,736,209 pounds for year ending June, 1899. This large increase for the year can be explained only by the boom and consequent inflation of prices, and although the period of inflation ended some months ago, the increased movement of wool towards this country, still continued during June, 1900. We exported 2,200,309 pounds during the year ending June, 1900, as compared with 1,683,419 pounds for previous year, but this trade during June, 1900, came to a standstill, as only 15,000 pounds are reported for that month.

—The value of manufactures of wool imported into the United States during the year ending June, 1900, was $16,166,551, against $13,832,621 for the previous year. The exports in same line for June, 1900, foot up to $1,362,861, and for same month last year $1,078,041.

—Manufactured silks valued at $30,89-,966, came into the United States during the year ending June, 1900, compared with $25,109,074 for the preceding year. The imports of raw silk for the year ending June, 1900, were valued at $45,329,760, against $32,479,627 for the previous year. Our exports of both raw and manufactured silks were unimportant.

The Development of the Flax Fibre Industry in the United States.

For a number of years past, inventors have been laboring with the problem of utilizing the flax straw from the immense flax crops in the Northwest.

If flax is raised for the fibre, the seed is of comparatively small value, while if the seed is the primary object in the crop, the straw and fibre has been in the past almost worthless, with the methods for getting out the fibre which have been employed for centuries on the continent of Europe.

FIG. 1.

LONG LINE FIBRE REGULAR LINEN SYSTEM.

FIG. 2.

FLAX STRAW.

The long line fibre from which flax yarn is spun, is obtained from the straw by the slow process of retting. The quality of the flax fibre depends largely upon this process of retting. The method employed abroad for retting flax is long and tedious. In Belgium the flax is cured in the field, and held until the next summer, when it is retted by steeping in slow running water, while days and nights are warm. Dew retting is sometimes employed, but it is uncertain, owing to the variation of the weather, and the best fibre is produced by river retting. One river in Belgium has been found superior to all others for this purpose, and to this river the flax from all parts of Europe is carried to be retted. Repeated analyses of the water of this river have been made, but chemists have failed to discover the reason for its greatly superior retting qualities. This Courtrai flax, at it is called, is the finest in the world, and sells for

27 cents per pound, while the Irish flax is worth but 13 cents per pound. The difference in color and quality is said to be entirely due to the retting process.

In the process of manufacturing the flax into linen yarn there is a certain amount of waste made, which is too short to be worked over into yarn on regular flax machinery, as these machines are suited only for the long

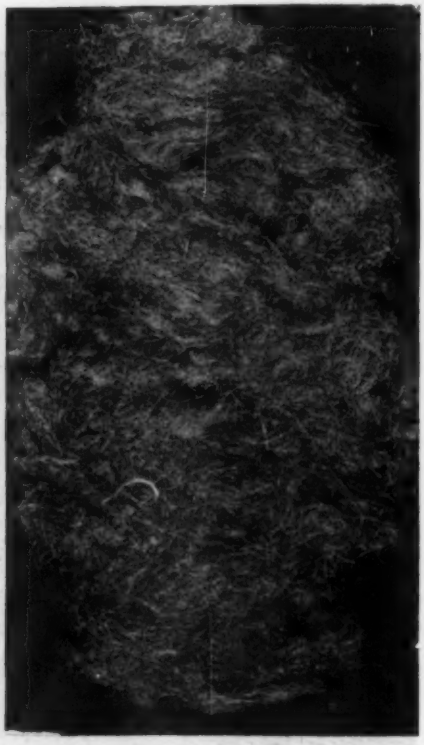


FIG. 3.

FLAX STRAW CLEANSED BY EAST-WOOD-NORMAND MACHINE.

stapled flax fibre, as shown in Fig. 1. This waste, owing to the peculiar nature of the flax fibre, could not be worked on the ordinary woolen or worsted machinery, and up to a recent period, was used only for paper stock, and sold for two or three cents per pound.

About 10 years ago experiments were begun in New England by certain enterprising and persistent men, with a view of spinning this flax waste. Much money was expended in fruitless experiments, and yet these men persisted in their attempt. The experiments were conducted in various mills leased for the purpose and surrounded with a great deal of secrecy.

After several years of failure this idea of spinning flax waste excited only derision in the trade, as being a sort of sea water gold scheme. The flax was there, to be sure, but it seemed impossible to spin it.

At this time, when these experimenters themselves were ready to abandon the scheme, a bright man, employed by them as a carder and spinner, impressed with the possibilities of the process, if it could be made successful, hit upon a plan by which the stock could be spun on a worsted spinning frame.

A mill in New Hampshire was secured, and since then this first plant and others in Massachusetts have been using the process.

Recently it has been discovered that, when the flax fibre is properly prepared, it can be successfully worked on cotton machinery. This was another step in advance.

These experiments related to the mechanical process of carding and spinning. While they were being carried on, the problems of how the western flax could be retted and bleached were claiming attention. Flax waste needed no retting since it was the waste from Irish linen mills using the stock already retted by the most approved foreign methods, and this product furnished the raw material for the mechanical experiments already referred to.

The difficulty in utilizing the flax straw from the Northwestern crops has been that the fibre is very short and harsh, and the Old World processes of retting, even if satisfactory, cannot be adapted to circumstances in this country. So chemists and inventors have striven for some quick and efficient process, first, of separ-

ating the fibre from the straw, and second, of degumming the fibre so that it can be worked on the textile machinery with which we are familiar. Within the past few years much progress has been made toward the desired end, and a further incentive has been offered through the fact that the straw, after the fibre has been extracted from it, has a value for raw material for paper makers' use when reduced to pulp.

There are several different processes having the same end in view, and there are now in Minnesota a number of flax, straw and fibre mills which purchase from the farmer at a cost ranging from $1.50 to $2.00 per ton, the straw which was formerly burned as waste. In the National Flax Fibre Co.'s system the flax straw, shown in Fig. 2, is run through a special separating or cleaning machine, known as the Eastwood-Normand machine, which they control, coming out in the condition shown in Fig. 3. Some of these mills separate the fibre from the straw for textile purposes, others convert it into pulp for paper makers. There are several spinning and weaving establishments East and West which have been more or less experimental.

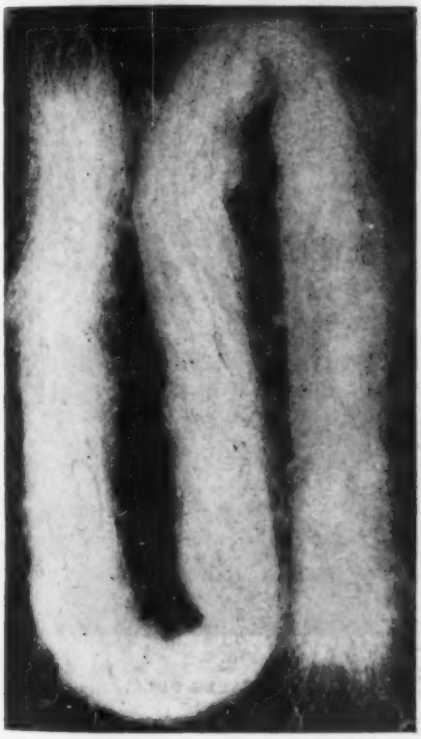


FIG. 4
FLAX SLIVER FROM THE CARD.

FIG. 5.
FLAX ROVING

The character of the machinery employed varies according to the ideas of the inventor. By some processes woolen cards are employed, and the spinning is done on worsted frames and twisters. The fibre is rather harsh and brittle, and one of the principal difficulties to overcome has been to make it draw readily in the yarn processes. The National Flax Fibre Co. claims that

by their process the fibre is degummed and left in such shape that it is readily worked on cotton machinery, with a waste of not over 8 to 10 per cent.

The company states that the retting process, which occupies weeks abroad,

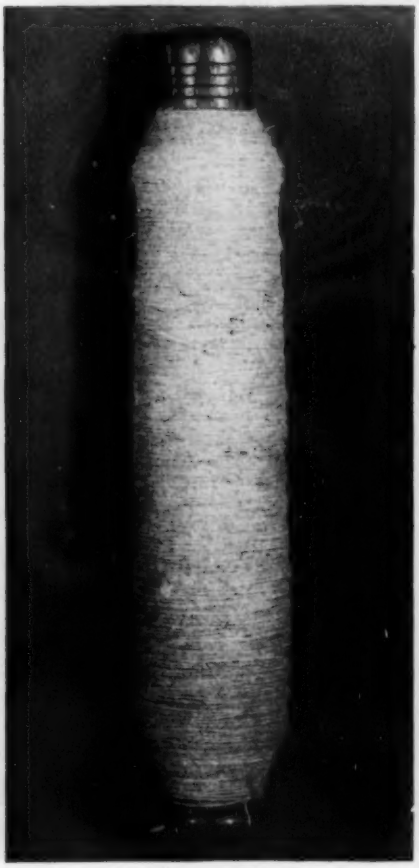


FIG. 6.
FLAX FIBRE YARN.

requires by the new process less than an hour. It is then run through a cotton card, and in Fig. 4 is shown a sample of the carded sliver ready for the draw frame. The drawing process is completed by the speeder, which delivers the roving as shown in Fig. 5. The spinning frames convert this roving into the yarn shown in Fig. 6.

For every ton of fibre obtained in the preparatory process, there is produced four to five tons of shive, which is part of the stalk to which the fibre clings. In Fig. 7 is shown this shive reduced to paper pulp. Great claims are made for this branch of the business, it being stated that the income

FIG. 7.
LINEN PAPER PULP.

from this source will equal that from the manufacture of the yarn and cloth.

This company has recently purchased a plant near Boston, where it is installing a 10,000 spindle cotton mill equipment, and proposes to manufacture coarse linen crash on cotton machinery, using this fibre. By their process of degumming, they claim to reduce the fibre to its fundamental staple. They state that the difficulty hitherto experienced in using the fibre on cotton machinery has been that it was not reduced low enough, and

what appeared to be independent fibres were really composed of several component parts, which separated in manufacturing processes and prevented draft and other successful manipulation on cotton machinery.

The experience gained in the experiments of the past 10 years has been so wide and exhaustive that there seems to be good ground for belief that the problem is near solution, in which case, it ought to have quite a marked effect in certain branches of the cotton industry.

DECISION IN CHINA SILK CASE.

The United States classification board of U. S. customs appraisers, has decided in the China silk case that these goods should bear the higher duty under paragraph 311, which assesses goods made of cotton and silk, of which cotton is the component part of chief value, at 8 cents per square yard, and 30 per cent. ad valorem.

The sections under which the importers endeavor to bring the goods in, provided a duty of 60 cents per pound and not over 50 per cent. ad valorem.

The dispute hinged on the question of whether the component part of chief value in these goods was cotton or silk. Both sides admitted that 90 per cent. of the weight of the goods was cotton, the other 10 per cent. being silk, but the importers claimed that the value of the cotton yarn was placed too high, thus making the proportionate value of the cotton part of the goods higher than it should be. This question of fact as to value of cotton yarn can be easily determined, and it does not seem probable that the appraiser erred here, and rendered his decision reversible, on a point, which is so easily established.

But the most interesting part of the dispute was on the second claim of the importers, that the cost of dyeing should not be apportioned between the cotton and silk according to their respective weights, but that one-half of the cost of dyeing should be added to the value of the silk, thus increasing the proportionate value of the silk in the goods, and bringing them in under the lower duty, as goods whose component part of chief value was silk.

The testimony shows that the French dyers charge for dyeing China silks according to weight, and regardless of what the proportions of cotton and silk are. For dyeing 100 pounds of the goods composed of 10 pounds of silk and 90 pounds of cotton, the cost would be the same as for dyeing 100 pounds of cloth composed of 30 pounds of silk and 70 pounds of cotton.

In both classes of goods the importers claim that one-half of the cost of dyeing should be added to the value of the silk. If this 50 per cent. added to the value of the silk in goods, where only 10 per cent of silk is present, is fair, then of course 50 per cent. of the cost of dyeing (which is the same for both kinds of goods) added to the value of the silk in goods, where 30 per cent. of silk is present, is altogether too low.

The decision seems to be in accordance with common sense, and a reasonable construction of the statute.

THE FIFTY-EIGHT HOUR LAW.

The decision of Judge Bell in the Massachusetts Superior Court, dismissing the case against the Hargraves and Parker Mills, charged with a violation of the 58-hour law, establishes the right of the mill owner to employ an operative for the number of hours fixed by law, regardless of the fact that that same operative may have worked for another mill during the same period. The court states that, while the law restricts the mill as to the time it may employ an individual, it places no restriction upon the operative during the balance of his time, except as regards employment by the same party, for whom he has already worked the time prescribed by law.

The decision affects in no way the vital principle of restricting hours of labor in our mills. That principle has

become thoroughly established in our social system, and can never be annulled. The court says that after the worker has conformed to the law by working the legal hours for his employer, he can dispose for any lawful purpose of the balance of the time, as he sees fit; in other words that he is still a free man.

No one should or would be quicker to resent any interference with his right of action in this respect than the worker himself. But the existence of this right apparently has afforded an opportunity for mills in large manufacturing centers like Fall River, desiring to run overtime during rush seasons, to obtain help, who have already worked the legal hours for another mill, and thus defeat the objects of the 58-hour law.

A mill in such a place can employ operatives, who have already worked the legal hours for another mill. This practice undoubtedly defeats every object of the law restricting the hours of labor. It has not yet, however, become a general custom. The question is, how can the law be modified, so as to prevent the practice, and at same time conserve the individual freedom of the worker?

The court states that the operative after working the legal hours in the mill can, if he likes, work evenings, or any part of the remaining time for a grocer, farmer or other employer. Doubtless some feasible plan can easily be found for adjusting this matter without impairing the broad rights of the individual.

The practice complained of should not be allowed to defeat the objects of the 58-hour law. Some of these objects are to prevent such long hours from becoming the practice as to impair the general health of the operatives, particularly women and children; to distribute employment more generally among workers, where a surplus working force exists; and to insure at least a portion of the benefit, arising from labor-saving machinery, to the workpeople, and to give the workers more time for rest, recreation and education.

Every one of these objects has the full approval of public sentiment and of the large majority of employers in Massachusetts, many of whom have been mill workers themselves, and retain the fullest sympathy with workpeople.

There is no danger of the practice becoming an abuse at the present time, when mills are closed for lack of orders. Both employer and employee can now calmly address themselves to the solution of the problem, which will be easily found; for both parties, we think, are agreed as to the main principles on which such settlement should be established.

ONE LESSON FROM THE HOBOKEN FIRE.

The Hoboken fire, was from all accounts, caused first by the ignition of some cotton stored on the dock, but the rapid spread of the flames, and the consequent loss of life can be ascribed partially to the explosion of casks filled with whiskey, and the combustible character of the pier buildings.

After this calamity, it is difficult to believe that such fire traps will again be built on our harbor fronts.

The disaster has brought forcibly to men's minds the danger of fire from cotton, especially when in an open condition, or in combination with other inflammable material. The cotton on the Hoboken dock was in square bales, which were presumably in the customary torn and ragged condition, presenting favorable conditions for starting a fire.

While the necessity for fireproof buildings on our docks is made evident, it is equally clear that a stop must be put to the disgraceful way in which cotton has been and is still packed for shipment.

This condition is admitted by all. The remedy will be found in compressing the cotton harder, and covering it more securely. These two conditions

are supplied in the case of the round bale, but before assuming that the round bales afford the security desired, we should know whether this form of bale carries with it any fire risk peculiar to itself.

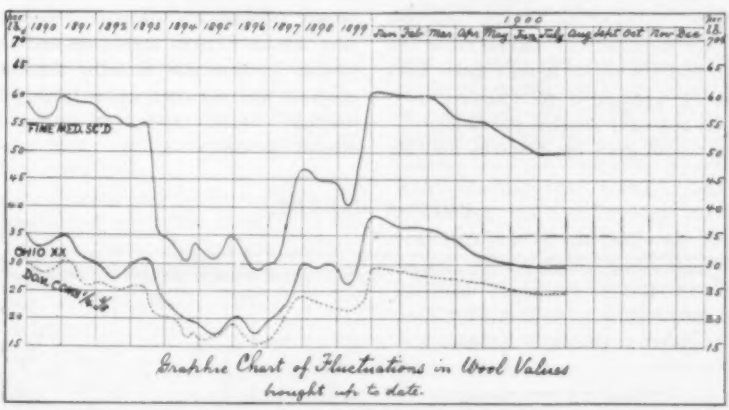
The fire resisting qualities of this new system of baling are due wholly to the greater density of the material, which prevents ready access of the fire to the cotton.

The same principle of fire resistance would apply equally well to cotton pressed in any other form, and impartial investigation of the various forms of cotton bales might establish the fact that some one of them was attended with less risk of fire than are the others.

In recent years cotton baling has been the subject of many inventions, among them being one, in which the bale is enclosed in sheet iron, leaving none of the fibre exposed.

Lessons learned are the only benefits to be obtained from this Hoboken horror.

WOOL MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900
Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec
FINE MED. SC'D
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DOM. COMB'G

Graphic Chart of Fluctuations in Wool Values brought up to date.

The decline in wool values, which began in January of this year, and has continued without interruption during the whole of the first half of the year, has in July shown the first indications of coming to a stop.

The decline in London in the early part of the month threatened to keep prices on their downward course, but heroic measures in the shape of heavy withdrawals, postponement and omission of sales, served to steady prices, and here in this country the near approach of the opening of light weight goods served to restrain holders from selling the wool which they had carried so long on a falling market.

Wool dealers are carrying heavy stocks of wool, which show today a large loss on paper. Unwillingness to realize this loss, and the hope that a revival in the goods market would send wool values up, prevented them from meeting the low set offers made by a few manufacturers.

The 1899 boom struck the wool market when fine medium territory was selling around 42 cents. This grade is now selling for 50 cents, showing that the decline has not yet wiped out last year's advance.

It may be safely assumed that manufacturers have no wool on hand purchased before the 1899 boom, consequently woolen goods today must be made from high priced raw material, and an advance of 10 per cent. to 15 per cent. in the goods market is necessary to compensate manufacturers for the increased cost of wool at today's quotations consequently the advance of 5 or 10 per cent. reported on light weights, as a matter of fact, leaves the manufacturer in a worse

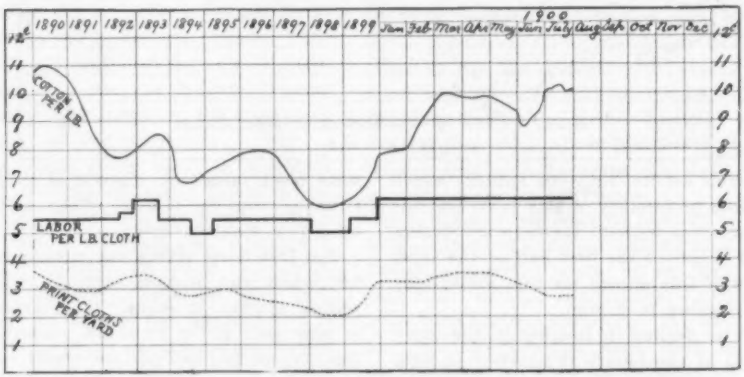
condition than he occupied a year ago.

The general belief that stocks of wool in manufacturers' hands were small, and that purchases would have to be made to cover orders taken for light weights, was reflected in a strengthening of wool values during the last half of July. The low prices for job lots were no longer quoted, and dealers were decidedly more cheerful. Sales for the last week of July, while far below the average business, showed a marked increase over the preceding weeks. The long depression in the wool market found the western grower financially well prepared to meet the strain. He has steadily declined the offers from the East, and the result is that more wool is being consigned to Eastern merchants than for several years past.

Sentiment goes far towards making prices, and the sentiment in all the world's markets is distinctively more cautious, a marked contrast to the buoyancy of 1899, when wool dealers acted as if they believed the last downward movement in wool prices had taken place. All have had their lesson taught again in shape of reaction and losses.

The influence, which the future course of the woolen goods market may exert on wool values will also be in the direction of conservatism, for the retailer and jobber have both been hit by the reaction from the 1899 boom. They will be looking for cheap fabrics, and this will necessitate cheaper raw material, and increase the business of mills that use no wool and yet turn out a large production which takes the place of woolen goods.

COTTON MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899
1900
Jan Feb Mch Apl May Jun July Aug Sept Oct Nov Dec
12¢ 11 10 9 8 7 6 5 4 3 2 1
COTTON PER LB.
LABOR PER LB. CLOTH
PRINT CLOTHS PER YARD

GRAPHIC CHART OF FLUCTUATIONS IN PRICES OF COTTON, LABOR AND PRINT CLOTHS.

The cotton market during July has been featureless. The customary fluctuation due to speculative influences have taken place and are reflected in the chart by the irregular July line.

The situation is peculiar and decidedly mixed. On the one hand we have the largest acreage planted with cotton ever recorded; weather conditions have been with slight exceptions, generally favorable; the goods market is depressed; prices for both yarn and cloth have suffered a sharp decline, with little business being done at the lower prices; many mills are either shut down entirely, or are curtailing production; the trade in cotton goods with China has ceased owing to the Boxer insurrection.

Despite all of these conditions calculated to depress the price of cotton,

we find that staple selling in July for the highest price it has brought in over nine years. We must go back to the early part of 1891 to find cotton selling as high as it is today.

The explanation of these apparently conflicting facts is found in the small amount of cotton now on hand.

The purchases made in Liverpool for consumption have been smaller this year than for years, and yet the stock on hand at that place has rapidly declined to 318,000 bales, July 27th. This is less than a third of the stock on hand there a year ago. This condition is practically the same when the world's stock is considered. On the same date, July 27th, the Chronicle reports the total visible supply as 1,048,722 bales, which is a decrease of 1,517,203 bales compared with same date of 1899, a loss of 1,004,740 bales from 1898, and a decline of 327,865 bales from 1897.

This condition of affairs turns the attention of all cotton markets to the American crop. The reports indicate favorable conditions during this critical time, but it is the weather in the Southern States during the next two months which will decide the size of the crop, and its value per pound.

The cotton manufacturers have been caught at both ends of the line. Cotton has gone up and goods gone down, while labor has remained at the high-water mark. Those mills that have unfinished contracts have made every effort to deliver the goods on time, while other mills facing the goods market, as it actually exists today, have taken the only course consistent with solvency, and have closed down their mills. The mills in England and on the Continent are passing through a similar crisis. The loss of the Chinese market falls chiefly on them.

The transactions in spot cotton during July have been small, manufacturers being disinclined to load up with 10-cent cotton, but as the stock on hand is light, the bull operators have found it easy to maintain the quotations at the high point already reached.

SHRINKAGE OF COTTON GOODS EXPORTS.

The most interesting part of the statistics of foreign trade of the United States in textiles is found in the figures for manufactures of cotton. The exports shrunk from 412,004,055 yards for the year ending June, 1899, to 352,194,989 yards for year just closed, while on the other hand the imports of cottons in a manufactured state, increased in value from $32,054,434 for the year ending June, 1899, to $41,299,836 for the year ending June, 1900. Here is a loss of 59,809,066 yards in exports, and a gain in value of imports of $9,245,402 for the year just ended. Owing to the Chinese troubles, we sent to that country only 9,927,376 yards of cotton cloth in June, 1900, as compared with 35,306,208 yards for same month last year. Instead of advancing to the position where we would manufacture cotton goods for the world, we have during the past year lost part of the trade we had secured. These cold facts should be carefully scanned by those who have advocated unlimited mill extension in this country to supply a foreign market.

GENERAL DRAPER RESIGNS AS AMBASSADOR TO ITALY.

General William F. Draper, of Hopedale, Mass., who has been our ambassador to Italy during President McKinley's administration, has tendered his resignation from that office. General Draper returned home in July on vacation, and realized that the enormous development of the business of the Draper Company demanded the personal presence and attention of all its higher officials, and besides that, many personal business interests could no longer be neglected.

It is greatly to be regretted that our diplomatic service offers no permanent field of service for men of large affairs and great business capacity. Neither in salary, nor stability of office, does the prospect warrant the neglect of large business interests for a man in

active commercial life, except for a short time.

General Draper has been one of the most acceptable representatives that the United States has sent to Italy, and most cordial relations have existed between him and the Italian court. The diplomatic business of the government has been ably conducted, while his large personal means and happy faculty for social functions, seconded by his wife's talent, has made the American embassy a more prominent factor in Roman life than ever before.

The growth of the business of the Draper Company for the past few years, and especially in the last year, has been phenomenal. The avalanche of orders for the Northrop loom has taxed the facilities of their already large plant to the utmost, and huge additions are being made which will increase the capacity of the plant to 4,000 hands. When it is considered that no longer ago than 1893, the low ebb of the cotton business had reduced their working force to about 300 and that a year ago 1500 hands were employed, a full appreciation of the expansion may be had. Besides that, the new Belanger rotary spinning spindle may claim a large share of attention, when, like all other Draper products, its development has reached the point when it can be put upon the market with every assurance of being all that is claimed for it.

Notes of the Month.

—A prolonged campaign in China will necessitate clothing the troops with heavy woolen suits. The light flannel and cotton khaki, which answer for service uniforms in the West Indies and the Philippines, would be much too light for the winter weather in the latitude of Pekin.

—The committee, appointed by the Southern Cotton Spinners' Association, to investigate the question of a change in the method of selling their goods, has made its report. It expresses the opinion that no reason exists at present for reducing prices on cotton yarns, and that after the present flurry has passed, prices will resume a normal position. The committee believe that economies are possible in the method of selling goods, and while recommending no definite plan, they suggest establishing an agency by the mills, or the placing of the Southern mill accounts with a limited number of commission houses.

—With 35,000 negroes either idle or working as servants in Charleston, S. C., the mill at that place, operated by negro help, finds one-half of their machinery idle owing to lack of operatives and are advertising in the negro paper for help. It is stated that the negroes learn the work readily, but the difficulty is to keep them at it.

—The scarcity of help in an Oregon woolen mill induced the company to employ Japanese; their presence in the mill became so distasteful to the other employees that the house where the Japs were living was attacked and they were driven from the town. A similar trouble due to race prejudice arose in a cotton mill near Montreal, Canada. Here the help were French and objected to the employment of English speaking employees. The result was a strike and rioting.

—On July 2d, 1900, the new Canadian tariff went into effect, and after that date all goods brought into Canada from foreign countries bear 50 per cent. higher duty than if imported from Great Britain and her colonies. This preference is given only to those British colonies whose tariff on Canadian goods is as low as the minimum Canadian tariff.

—The prosperous condition of the Fall River mills during 1899 is shown by a comparison of their annual statements. They have in the aggregate reduced their debts $1,162,397, and increased the surplus $656,688. Nearly all the mills paid dividends of 6 per cent. or more. The high cost of machinery restricted additions to the plants and this cannot be considered a misfortune in view of the problem

they have before them today, of how to make 2¾-cent print cloths from 10-cent cotton.

—Our imports of raw cotton for the month of June, 1900, were 2,152,913 pounds, compared with 3,729,526 pounds for same month last year, but for the year ending June, 1900, we imported more than for previous years, the figures being 1900, 67,398,521 lbs., 1899, 50,158,158 lbs. Our exports of this staple both for the month and the year ending June, 1900, are less than for 1899; the story is told as follows: Exports June, 1900, 147,222 bales; June, 1899, 270,866 bales; for the year 1900, 6,090,144 bales; year 1899, 7,373,382 bales.

Foreign Notes.

—The heavy balance of trade against Germany in her trade with the United States has created a strong German party, desirous of imposing restrictions on our exports to that country. For the 11 months, ending May, 1900, we sold to Germany, goods valued at $174,750,108, and purchased from her goods to the value of $90,749,519. This means that Germany must pay us in cash or its equivalent at the rate of $7,636,417 per month. The German government however shows its appreciation of the real state of affairs, by negotiating the reciprocity treaty, recently concluded with the United States, and which was opposed by the anti-American party. The goods we import from Germany can be easily obtained elsewhere, while Germany would find difficulty in obtaining the goods from other sources, which she imports from the United States.

—During the past year an average advance of 42 cents per dozen has taken place in Saxony in prices of cotton and lisle thread hosiery.

—The decreased use of woolen hosiery is shown by the decrease in English exports of such goods while the exports of cotton hosiery show a marked increase.

—The drought, which has lasted for five years in Australia, and caused so much damage to the wool clip, has at last ended, and reports state that this season has been marked by heavier rainfalls than in any period since 1894.

—U. S. Consul Atwell writes from Roubaix, France, that tests of the textile plant Apocynecis has been made at Lille, Rouen and the Vasges. These experiments were made with the plant in the dry state, and also after three months' submersion in water, and are said to have established the fact that Apocynecis is 50 per cent. stronger than flax. The tests were carried on with great secrecy. This plant is sold in Cambodia for 6 cents per pound.

—The value of the imports of cotton yarns and cloth into France shrunk from $2,942,285 in 1889, to $1,143,525 in 1899, while French exports of the same class of goods increased from $2,888,431 in 1889, to $7,648,783 in 1899. These figures show the results of the policy of protection adopted not only by France but by nearly every Continental power.

—The ixtle fibre industry in the city of Saltillo, Mexico, is of great importance. The annual exportation of this fibre amounts to more than 5,000,000 pounds. It is shipped to the United States, England and Germany, principally, though small amounts go to other countries. There are numerous small establishments in Saltillo which weave the fibre into matting, cloth, etc.

—An automatic loom has been invented by John Ross, Belfast, Ireland. It has a circular box, the top box holding the shuttle during weaving, the relay being in a side box. When filling runs out the box turns so as to bring a full shuttle at the top, and the empty shuttle falls out.

—The German Association of Alizarin Manufacturers began its practical existence on the 1st inst. with advances of prices ranging up to 30 per cent., according to the description of the dye.

—In an interesting report of the Belgian consul at Constantinople, he states that the Turkish clip of mohair

up to 1875 did not exceed 5,280,000 pounds. Since that date it has gradually increased to more than 12,300,000 pounds, nearly all of which is consumed in Bradford, England. The price has fluctuated widely, the extremes from 1876 to 1895 being 97 cents and 24 cents per pound. In the last named year it rose to 65 cents per pound, the lowest figure since then being 29½ cents. The consul names nine grades varying at present time from 8 cents to 44 cents per pound, and recommends purchasers to order sample lots of different grades, and make tests of them in the mills before purchasing large quantities.

—The breeding and rearing of Angora goats for commercial purposes has been established in New Zealand in a small way. Reports from the flocks are favorable, and hopes are entertained that the industry will grow to large proportions.

—The cocoon crop in Turkey in the year 1899 yielded a brilliant result, being 1,841,175 pounds, as against only 992,250 pounds in the preceding year. In order to obtain a pound of silk there were required about 11 pounds of white cocoons and 12 pounds of yellow cocoons. The price of the cocoons varied from 22 to 28 cents per pound.

—German weavers of colored goods have formed themselves into a union, controlling about 140,000 looms. The negotiations were closed at Stuttgart. It is expected that the combination will succeed in raising the average prices of its products by 15 per cent.

—The annual report of the Silk Association of Zurich shows that with a value of $20,242,732 in 1899, against $18,454,048 in 1898, the exports of manufactures of silk from Switzerland reached high-water mark last year. According to the report the figures of the exports of 1899 are not likely to be exceeded in later years, as the Swiss silk industry seems to have reached its limit of production and cannot further increase it owing to lack of skilled operatives.

—The exports of wool from Uruguay to other countries in 1899, with the invoiced values of the purchases of each, were as follows:

	Lbs.	Valuation.
Germany	23,845,000	$3,454,911
Argentina	22,305,000	4,048,633
France	19,753,000	3,026,212
Belgium	15,136,000	2,649,229
England	3,790,000	737,195
Italy	1,491,000	325,387
Brazil	94,600	14,321
United States	59,400	12,777
Spain	8,800	2,131
Portugal	4,400	832
Total	86,487,200	$14,271,628

The exports of wool for three years were:

	Lbs.	Valuation.	Value. Lb.
1890	48,246,000	$7,865,811	$0.16⅓
1897	113,691,000	12,402,802	.11
1899	86,487,200	14,271,628	.16½

Merchants' and Manufacturers' 20th Century Exhibition.

The first exhibition of the Merchants' and Manufacturers' Exhibition Association will be held at the Mechanics Building, Boston, from Oct. 1st to 27th, of the present year.

This exhibition will be open to all products, and will undoubtedly be a striking demonstration of the advanced stage, to which the progress, made in the 19th century, has brought the arts and industries of New England.

These exhibitions serve a useful purpose by bringing to the masses of our people a knowledge of the new products and inventions of today. It serves to keep millions of people "up to date," and is an efficient means by which merchants, manufacturers and inventors can bring themselves and their wares in direct contact with large numbers of consumers.

October exhibitions in Boston have averaged 350,000 paid admissions for each fair, and each one of this large number carries away the memory of many machines and other articles, for which he or she is likely to have the most need.

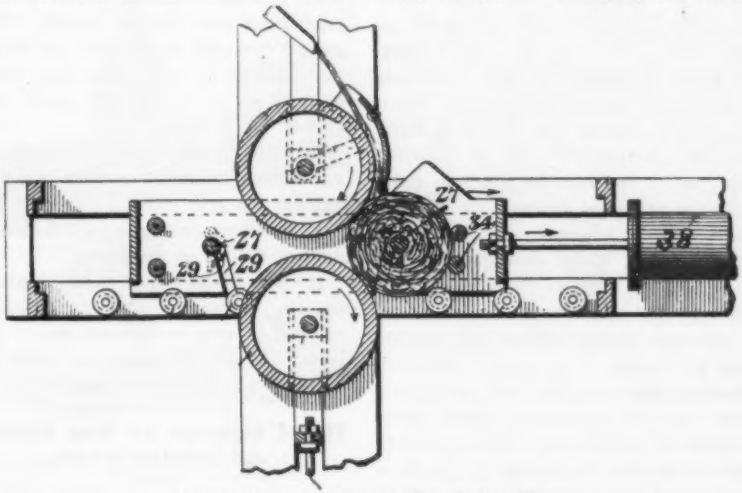
The words so frequently heard, "I saw it at the Mechanics Fair," is evidence that the exhibits are introduced to not only the visitor, but also through him to many others. It is an

endless chain of communication with the people of New England, who are among the largest consumers of useful products in the world.

Alterations are being made in the Mechanics Building for this exhibition, particularly for the department of working exhibits. There will be six acres of floor space, and the management expects the exposition will be visited by half a million people. The Department of Administration is now at Mechanics Building, Boston.

Cylindrical Cotton Press.

It will be recalled by our readers, that the decision in the Griffin vs. Swenson case awarded to Swenson or the American Cotton Co., priority on the three roll press invention, and to Griffin, priority on the continuous process claim.



CYLINDRICAL COTTON BALING PRESS.

The value of the continuous process lies in saving of time, changing from one bale to another. This saving is made not only in the operation of the press, but also extends to the gin and condenser, both of which operations must be suspended during the removal of the full bale, unless some means of making the change, while cotton is being fed to the press, is adopted.

The Griffin continuous process consisted in the employment of two presses and means of turning the feed from one to the other, when bale was full, by means of a swinging board or wing, which acted like a three-way valve. Swinging this board to close the entrance to one press, opened the entrance to the other.

Since that decision inventors have been working on this continuous process in order to find a substitute for the Griffin valve and double press arrangement.

A patent has been obtained by D. P. Wolhaupter of Washington, D. C., for such a press, and the accompanying illustration shows its construction. Only one press is employed. When the bale 27 is finished it is pushed out of the way by release of pressure from the cylinder 38, and at same time a carrier 29, places an empty roll 27, in position to receive the feed of cotton. Automatic devices are provided for releasing pressure to remove bale. The illustration shows the position of the full bale, as it is being taken from the machine, while the empty roll is being placed in position.

An Ounce of Prevention.

Probably the most frequent cause of accidents in textile mills is unguarded gearing. Very few of the fatal accidents occur in this way, but

the numerous minor accidents from this cause, particularly crushed and maimed fingers and hands, are recalled by every mill man.

Safeguards for preventing such accidents are the only means to alleviate this evil. A hand or arm almost instantly crushed, means that the victim carries the incurable injury through life. The accidents prevented by these safeguards cannot be known. The efficiency of such means as are adopted can be established only by comparative statistics.

The necessity for additional safeguards is generally admitted, and in England, where the statistics are very carefully compiled, we find there were 289 persons killed, and 16,487 injured in factories in the year of 1898. A large proportion of these accidents was due to unguarded gearing. Such accidents impress the mill men more forcibly, because they are on the spot, and yet in the case of machine gearing, the practical methods for prevention must be taken, by the builder of the machine, whose workmen are exposed to no dangers from the operation of this machine.

The machinery builder can provide much neater and more effective guards, than can the mill machinist, and the builder can in many cases design the machine to make its operation safe for the operator. It is a matter of congratulation that American builders of machinery are acknowledged to be in the lead in this matter of providing safeguards against accident.

The point of greatest danger is at the in-taking position of two moving gears, although the liability of the teeth of one gear catching the bystander's clothing, renders necessary the guarding of out-running gears as well.

In the case of machinery used where much dust and loose stock is flying in the air, it is often advisable to provide open or lattice guards, which will protect and yet permit of observation.

In some cases the moving parts are so numerous, that no support can easily be found for a separate guard; in such cases a metal disk attached to the end of the shaft and large enough to cover the dangerous parts, can be used.

An excellent means of supporting gear guards is to mount them on hinges; this insures their being always in place, and gives easy access to the gears when required. Often half way means of prevention are as dangerous as the unprotected condition. Where part of a gear is running under the floor, and is protected at the intake, there is great danger of accident by the shearing action of the gear arms and floor or guard. This danger can only be removed by bringing a fender to full height and width of gear, or by covering the gear completely.

In many cases it will be found advantageous to fasten a sheet iron disk against the gear arms. This will prevent accident and an accumulation of dust or flyings on the gears.

If there is danger of shafting catching the clothing, a tube can be easily applied in most cases and where this is not feasible all projecting pins, set screws, etc., should be removed.

Thread Separator for Ring Spinning and Twisting Frames.

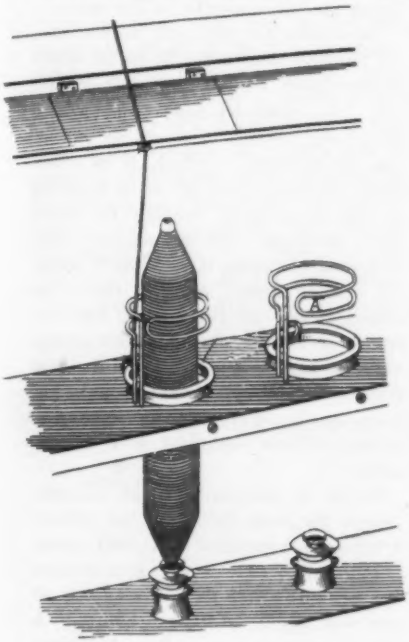
A separator for ring spinning and twisting frames, recently patented by John C. Wall and M. E. Schedlbauer, Jr., at Amsterdam, N. Y., possesses features which will commend it to practical men.

It consists simply of a piece of wire, bent in the form shown at the right hand ring in the illustration. The looped part of the wire at A is bent inwardly to a slight degree which prevents the thread from flying out through the open space between this loop and the upright part of the wire.

For nearly the whole revolution the thread is in contact with the guard and consequently there is a uniform

tension maintained which, it is claimed, keeps the traveler in an upright position and prevents any injury to the yarn by coming in sudden contact with a separator.

The inventors claim that the traveler will wear much longer when this guard is used. At the left of the illustration is shown the spindle and



bobbin in position and provided with the guard.

The device is in successful operation in the cotton warp mill of the Sanford Carpet Works, where Messrs. Wall and Schedlbauer are in charge. It has been given thorough trials, and has demonstrated its effectiveness.

The Harriman Automatic Magazine Loom.

The plain weaving process in the cotton industry, which for years had almost been at a standstill, is now the focus of the inventors' ingenuity. Fancy weaving in both cotton and woolen goods has been developed until it seems to have reached a point capable of meeting any requirement of the designer.

For the past few years the development of the automatic filling changing loom has been the feature of cotton manufacturing, and the builders have not been able to keep pace with their orders. Other looms on the shuttle changing principle have been under constant development, and it is now announced that the Harriman Automatic Magazine Loom, built by the American Loom Co., of Readville, Mass., is ready for the market. The special features of the loom are described in a circular, recently issued, from which we quote:

"This loom embodies the inventions of Mr. H. I. Harriman, and is the result of long study and elaborate experiment. The object sought was a filling supplying mechanism with such simplicity of construction and operation as would give the highest weaving speed, together with the least delicacy and care of mechanism.

The manner in which these most desirable ends are secured is as follows: When the filling is exhausted or broken the loom is stopped by means of the filling-fork just as is the plain loom. It should be noted that by means of a band brake the loom is invariably stopped with the shuttle at the magazine end of the lay. The action of the fork, however, also brings into play an extra or magazine shaft hereafter called the "change shaft." This change shaft, during a single revolution, not only replaces the spent shuttle with a fresh one, but also automatically restarts the loom at its normal speed. It therefore has three distinct duties to perform; one, to renew the filling supply; two, to restart the loom; three, to put itself out of action. The actions in detail are as follows:

Power being obtained from the loose loom pulley, a triple cam is rotated. This cam, through its levers and connections, raises the front board of the lay box on the magazine side, ejects the spent shuttle and inserts a new shuttle from a magazine on the breast beam,—the descending front board secures the new shuttle firmly in position. The magazine action being thus completed, a lever on the change shaft ships the loom belt

to the tight pulley and automatically restarts the weaving. Closely following this action, the third duty is performed by the releasing of the power connection between the loose loom pulley and the change shaft and thus the change shaft throws itself out of action.

Inasmuch as the change shaft can be run at any low rate desired, the stopping of the loom to change the shuttle makes the regular weaving speed of the loom entirely independent of the speed of the magazine mechanism. This means that the high weaving speeds of the latest and best plain looms are obtained, and yet the looms and shuttles are not subjected to the shock of the change of shuttles at high speed.

The points of setting are few and have wide leeway either side of their absolutely correct positions, doing away with all delicacy of adjustment.

As the mechanism is only called into action for five or ten minutes per day, according to the fabrics woven, as it moves slowly and very smoothly, and as it is stoutly built, it should last as long as the loom itself, and without any fear of breakage of parts.

The company claims that the weaver can handle with greater ease twice or three times as many looms equipped with this shuttle-changing mechanism as the plain looms she now runs.

Eight shuttles are commonly used, and devices are attached which do away with all delicacy in handling shuttles of different sizes and weights. They make a shuttle with a hand threading device which is sold at the regular shuttle price, and which in many ways is preferable to the shuttle where the filling must be sucked through the eye, but the old-fashioned shuttles may be used equally well.

Regular loom supplies, such as shuttles, cops, bobbins, harnesses, reeds, etc., may be used on the loom.

The advantages claimed for the Harriman Automatic Magazine Loom are high weaving speed, low magazine speed, simplicity of settings, strength of construction, fine quality of cloth, and cheapness of supplies.

We are informed that the Harriman automatic mechanisms have been successfully applied to the American, Kilburn & Lincoln, Lewiston, Lowell, Mason and Whitin looms, and are adaptable to any modern plain loom.

Hon. William C. Lovering, president of the Whittenton Manufacturing Co., and vice-president of the American Loom Co., thus speaks of the loom:

"It avoids all hard and unmechanical motions, and aims to do its work in the direct line of easy movements and well-acknowledged mechanical principles. When it comes to changing the shuttle or filling, it is absolutely impracticable to do it running at the same speed, so that the loom stops weaving, and by another and slower mechanism, takes time to make the change easily, when it starts up automatically at full speed, and resumes weaving. To watch its action at this moment is fascinating, and strikes the observer as wellnigh human in its operation; it seems as though it was endowed with intelligence."

There is something about the motion of the loom that gives the weaver a sense of assurance and restfulness, and greatly relieves the strain upon the nerves which is common to all weavers upon ordinary looms. A weaver may be absent from her loom if necessary, and yet she is perfectly conscious that nothing is going to occur to make a break or smash. The worst that can happen is for an end to part in the warp, or the shuttles in the magazine to become exhausted, when in either case the loom comes to a stop and awaits the attention of the operator."

—The exports of cotton goods from the United States to our new possessions for the month of May and for the 11 months ending May, 1900, were as follows:

	May, 1900.	11 Mos. ending May, 1900.
Cuba	351,544 yds.	7,186,241 yds.
Puerto Rico	837,244 "	3,184,404 "
Philippine Isl'ds	41,600 "	137,200 "
Hawaiian Isl'ds	294,600 "	2,535,396 "
	1,525,,'48 yds.	13,043,241 yds.

COTTON DEPARTMENT.

Practical Notes on Cotton Spinning.

WM. SCOTT TAGGART.

(Continued from May.)

Let us now work out a few examples in wheel work of a fly frame and by way of preface let me say that nothing helps so much to render a calculation easy as a rough sketch of the gear being calculated. There are a number of different arrangements of wheelwork on a fly frame, but once a student can distinguish the driving and driven wheels, very little difficulty will be met with. In Fig. 000 (March issue) the full gearing of a fly frame was given. It is composed of a number of sets of wheels, each set serving some special purpose. It will also be noticed that some wheels serve or act in more than one set, so, to assist the reader, the different sets have been taken apart and each movement can be clearly followed.

In regard to finding speeds, there is a very simple method now employed, viz., the use of a "tachometer." This instrument can be applied to a shaft, just as in the case of an ordinary speed counter, and it indicates the speed per minute at once without the use of a watch. It is, however, advisable to be able to make any calculation in a cotton mill without the aid of a speed counter.

In Fig. 0000 is shown the gearing for driving the front roller. On the end of the driving shaft is a wheel B, arranged to be changed for purposes that will be afterwards pointed out. This drives the top cone shaft wheel V through a carrier (single carrier wheels never enter into a calculation, as they are not used for increasing or decreasing speed, but only for changing its direction.) On the other end of the top coneshaft is a wheel W, which drives a big wheel X keyed on the end of the front roller.

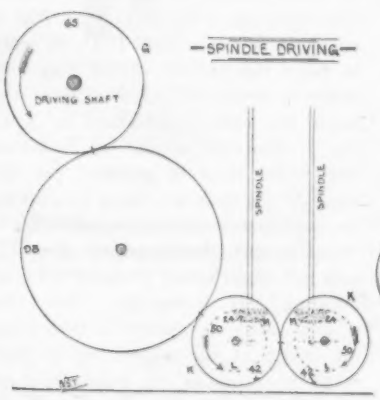


FIG. 00000.

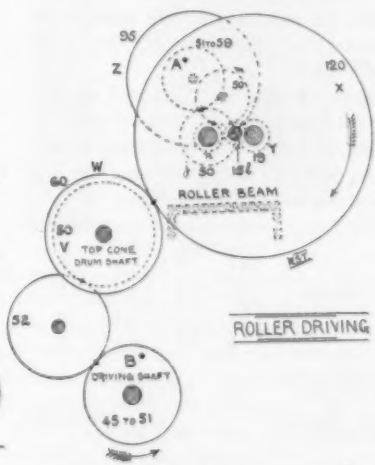


FIG. 0000.

To find the "speed" of the front roller, we have four wheels to consider, viz:—B driving V, and W driving X.

B the driver wheel has say 45 teeth.
V the driven wheel has say 50 teeth.
W the driver wheel has say 60 teeth.
X the driven wheel has say 120 teeth.

Suppose the driving shaft runs at

220 revolutions per minute, then the speed of front roller will be equal to

Speed of shaft × (B × W) ÷ (V × X) = (220 × B × W) ÷ (V × X) = (220 × 45 × 60) ÷ (50 × 120) = 99 revolutions.

On the other hand, suppose we know the speed of the front roller, say 120 revolutions per minute, and we want the speed of the driving shaft, using the above wheels. In this case we must work backwards, assuming the front roller to be the driver. Then X drives W, and V drives B so that

120 × (X × V) ÷ (W × B) = (120 × 120 × 50) ÷ (60 × 45) = 266⅔ revolutions of shaft.

This last calculation is very useful, especially in planning a new mill. In such a case, one generally starts out with a clear idea of what the speed of the front roller must be, and from this speed the machine driving shaft is calculated and afterwards the line shaft and pulleys.

Speed of Spindle: The speed of spindle on flyer frames is a factor that appears to depend on individual experience, but the following may be considered good modern practice.

COTTON.	Slubber, Revs. per Min.	Intermediate, Revs. per Min.	Rover, Revs. per Min.	Jack, Revs. per Min.
Indian and Low American	550	750	1100	-
American	550	700	1100	-
Good Egyptian and Sea Island	400	650	900	1120 to 1050

Fig. 00000 shows how the spindles are driven from the driving shaft; it is a simple arrangement and easily calculated. A wheel G on the driving shaft drives through a carrier the wheel K on the spindle skew gear shaft.

If we know the speed of the driving shaft, then the following rule will give us the speed of spindle:

Speed of shaft × (G × L) ÷ (K × M) = (266 × 65 × 50) ÷ (42 × 24) = 857 revolutions of spindle.

If we know the speed of spindle required, then we can calculate what the driving shaft ought to run at, in which case we reverse the calculation above, using the spindle bevel wheel M as the first driver. For instance, suppose the spindle speed is 900, then speed of spindle × (M × K) ÷ (L × G) = (900 × 24 × 42) ÷ (50 × 65) = 279 revolutions of driving shaft.

The Manufacture of Seamless Woven Bags.

Professor R. Dantzer in l'Industrie Textile.

(Translated for the Textile World.)

Bags are made in various sizes, depending on the use to which they are to be put, and of various materials, the most common being linen, cotton and jute, the latter making the cheaper bags. The weaves generally employed are the plain and the three-leaf twill. The ordinary sack is made of two widths of cloth, sewed lengthwise, from A to B and C to D, Fig. 1, and then sewed across B D, in order to form the bottom of the bag. In order to avoid the unraveling of the cloth, the edge is hemmed at A C, Fig. 1. The cloth should not be woven any wider than is required for the bag. If the bags are made by cutting up wide pieces of cloth, a raw edge is exposed and, consequently, the bag will not stand much pressure without bursting. It is evident that this trouble can be remedied by increasing the width of the edges, but in that way the economy of hand labor is partially sacrificed by waste of material. For certain uses, bags are made from cloth cut double the width of the sack, but this method is not generally employed on account of the unsightly appearance.

In order to dispense with hand labor, great effort has been made to weave a seamless bag, by using the same methods of construction as in the manufacture of lamp-wicking. The seamless bag is made by weaving a double cloth, the even numbered picks making one cloth and the odd numbers the other. The warps for both fabrics can be put on same beam

if necessary, but usually two beams are used, as it is then easier to find and replace broken threads.

The warp is reeded with two threads in a dent, each dent containing one thread of each cloth. Fig. 3 shows the weave and draft of the double cloth. The two threads are tied together at the sides by the filling thread, which passes first through one

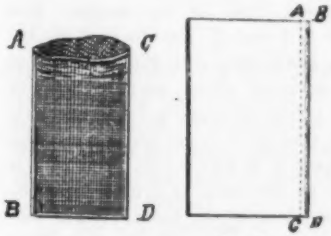


Fig. 1. Fig. 2.

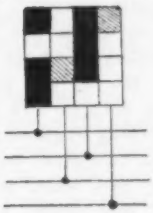


Fig. 3.

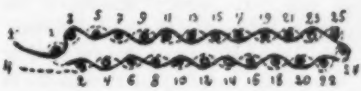


Fig. 4.

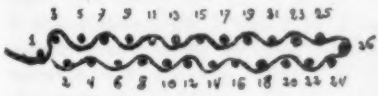


Fig. 5.

fabric, and then through the other. In this way, a tube without selvage is formed, and when it is well done, no trace of the edges can be discovered. In order to have the weaves of the two fabrics joined together perfectly, it is necessary that one of the warps have one thread, more or less, than the other.

Figs 4 and 5 represent the cross section of a double cloth, the points representing warp and the curved lines representing the filling. In the first of these figures, where there is an odd number of threads, it will be noticed that the stitching is perfect, and that the filling passes first under, and then over, the thread. With the second arrangement, the two warps having an equal number of threads, two of the warp threads will have to be run together in order to bring adjacent filling threads on different bars of the weave. These remarks concerning the number of threads are also ap-

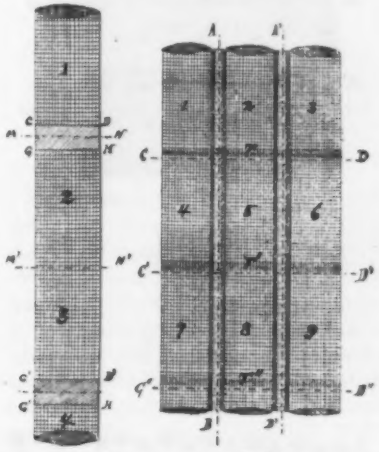


Fig. 6. Fig. 7.

plicable to other weaves besides the plain. For example, with a three-leaf twill, it is necessary that the upper warp have a number of threads which is a multiple of three, while the lower warp will have one less.

Fig. 6 shows the manner in which the bag is woven. The part C D G H represents the cloth for the bottom of the bag. This is cut along the line M N, which forms the bottom of bags 1 and 2. The bags 2 and 3 are separated by a cut along M^1 and N^1, the bottom of bags 3 and 4 being made by the cloth C^1, D^1, G^1, H^1. In this way, two bags are woven before it is necessary to weave the cloth for the bottoms. After weaving, the sack is turned inside out, in order that the edge of the cloth at the bottom may be on the inside. Then the top of the bag is hemmed to prevent raveling.

The manufacture of seamless bags,

such as we have described, is very limited on account of the high cost of manufacturing. It is necessary to reduce the speed of the loom, while it is very difficult to examine the cloth underneath, and time is lost in changing the weave for the bottom.

In order to reduce the cost, various

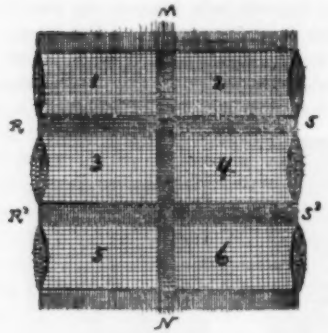


Fig. 8.

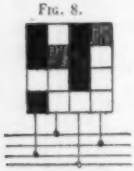


Fig. 9.

Fig. 10.

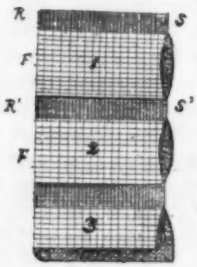


Fig. 11.

attempts have been made to weave several bags at the same time. The first of the patents taken out on this idea, was that of M. A. Detroy, in 1887. In this method a loom called the stitching loom was employed. It is used principally at St. Etienne in weaving ribbon and lamp-wicking, and there are as many shuttles used as there are warps in the loom. This method is not only very little employed, but its use is confined to the manufacture of small bags for sportsmen's use, and for holding gold and silver.

Fig. 7 represents the Coulombe system of seamless bag weaving. In this cut, three sacks are represented as being manufactured at one time, but it is evident that this number can be varied, and depends on the width of the loom, and of the sacks. The sacks 1, 2 and 3 are formed by the plain cloth between them. Then in the centre of these narrow strips of plain cloth, the warp is removed, leaving it very easy to cut the filling along the lines A, B and A^1, B^1. That cut is made as the cloth is drawn over the breast beam of the loom. When sufficient length for one sack has been woven, the plain weave T, T^1, is substituted. These sacks are then separated by cutting along the line C D, apd then C^1, D^1. In this method the middle sacks, such as 2, 5 and 8, do not have as strong edges as are on the outside of the two other bags, on account of the raw edge, which it is necessary to sew down. Of course, this method does not make the seamless bag. It merely simplifies the work necessary for their completion.

The process Detroy, shown in Fig. 8, shows the weaving of two sacks of one width. The adjoining sacks are joined together by the plain weave fabric M, N, and the consecutive bags, such as 1 and 3, are connected by a second strip of plain weave fabric, R S. After weaving, the different bags are separated by cutting the plain weave fabric in the middle. The raw edges are then fastened down. The only advantage in this method is that the hem is avoided, as it is replaced by the selvage. The weave employed in all of these fabrics is that shown in Fig 3, viz., a double plain weave.

M. Damotte used a one and one weave in the warp, and two and two weave in the filling. This is shown in Fig. 9. Fig. 10 shows a cross section

of this fabric. The passage of the filling from one fabric to another takes place only on one side, F, Figs. 10 and

bags are made on special bag looms made for the purpose which give a large production.—Ed.]

FIG. 12.

11. Fig. 11 shows the three bags, 1, 2 and 3, woven together, each of them being separated by plain cloth, R. S., which forms the sides. Bags made in this way do not need hemming, nor seams at the bottom.

As for the methods of Knight & Howard, they differ from the Coulombe system only by reason of a reduction of the opening, avoiding the hem.

The method used by Bloch, Meyer & Company seems the best. The adjoining sacks are separated by several empty dents in the reed, the filling floating across the space. As fast as the filling is inserted, it is cut in the centre of this space. These short ends are then drawn back into the cloth with the following pick. Fig. 12 gives a cross section of such sacks. In that figure, the continuous lines indicate the filling for the upper cloth, and the dotted lines those for the lower cloth. The distance between the two edges is about four centimetres, consequently, after cutting, the ends of the thread are two centimetres long, and when they are drawn back into the cloth, it makes a distance of four centimetres between the ends of the threads, which insures a good, solid fabric. This work is done by a loom provided with needles, which draw the threads in, and is an English invention, called the Multiple-inter-selvage. The bottom is made by a plain weave fabric, as in the other methods already described.

[In this country seamless cotton

Improvements in American Cotton Machinery.

GEO. OTIS DRAPER.

Read before the Southern Cotton Spinners Association.

(Continued from July.)

The original idea of spinning with a ring and traveler, appears in the American patent of John Thorpe, in the year 1828, being contemporary with the invention of cap spinning, by Danforth, in 1829. The latter idea gained greater headway at the start, but the ring and traveler gradually came into prominence, being well established for use in spinning warp yarns by the 60's. The double spinning ring of Carroll, invented in 1864, is the oldest invention of its kind to continue in unchanged form to the present day. This idea made no real change in principle, but won its place by cheapening the cost. The wonderful inventions, by which the speed of the spindle has been increased, due to the genius of Pearl, Sawyer, Rabbeth, Sherman, Atwood, Taft, Woodmancy, and various Drapers, have been largely responsible for the continued encroachment of this method of spinning upon the territory formerly monopolized by the mule. The modern spindle is undoubtedly one of the most peculiar and original mechanical novelties known to science. No one has yet satisfactorily explained how a necessarily imperfect mechanical structure can attain absolute concentricity in revolution, being independ-

ent of changes in speed, and other serious variations in uniformity of affecting conditions. Pearl reduced size and weight, to lessen vibration, Sawyer provided a steadying upper bearing within the load, Rabbeth discovered the vital principle of a yielding bolster, Atwood made the whole structure yield, to meet the peculiar conditions of silk spinning, Sherman, Taft, and Woodmancy made important changes in design, and the various Drapers, and inventors under their charge, have perfected many important details. The speed of the old spinning frame was absolutely limited by the jar of the spindle above 6000 turns per minute, while with the modern structure I have seen a spindle turn at 40,000 turns per minute, with absolute perfection, which is, of course, much higher than we now ever expect that the rest of the frame can run. The change of speed from the common type to the Rabbeth type, not only increased production, but it attained this gain without proportionate increase of labor cost, power, or wear. The saving to the world by these inventions has been figured as worth $50,000,000.00 in benefit to this country alone, and it has also been figured that the modern high speed spindle enables one operative to equal the product of 10,000, or more, spinsters, using the olden spinning wheels of the type well known within the lives of many here present. It hardly seems possible to realize that the inventions of one century have lessened human labor in one line at the ratio of 10,000 to 1; but the facts are actually understated in this extraordinary assertion.

The increase of the speed involved a necessity for separating appliances between the spindles, the earlier trade type being invented by Doyle, and those now being introduced by Chandler, Rhoades, and Owen. Within the last 12 months, certain startling experiments with revolving rings are known to have been carried on, which point to great gains in speed by overcoming the former difficulty with the wearing out of travelers, and the breaking down of ends, if present limits were stretched. This line of invention was started by a man who had never seen a spinning frame before his first attempt at its improvement, namely, the Mr. Victor Belanger, before mentioned, who became interested in the problem after certain discussions arising from consideration of other mechanical devices, about which I had advised with him. While every great change demands a certain length of time in which to master details of construction, etc., I have great confidence that we shall soon see practical application of his ideas. Like the high speed spindle, this new ring idea involves another new principle in mechanics, it being found that a ring, allowed proper freedom of movement, can be revolved by its traveler at enormous speed, without frictional contact in its surrounding casing. It is theorized that a current of air is induced, which may prevent friction. It certainly prevents heat. This idea, like that of the spindle, transfers the limit of speed to some other part of the frame, and no one can prophesy where the end shall be found. The difficulty of piecing up ends at high speed has already been anticipated by the invention of a roving clamp, to hold the end of roving from delivery, if the yarn is broken. While more than a dozen devices of this nature are known in the state of the art, the most practical construction, to my mind, is embodied in a recent idea devised by Northrop, the loom expert.

The spinning frame has practically ended the use of the mule on warp yarns, in this country at least. It has also more than held its own, in recent years, particularly in the field of filling yarn. This change is largely due to the persistent efforts of the late George Draper, whose vigorous crusade encountered a most discouraging conservatism and prejudice. While the modern filling frame owes little to any special invention not formerly

used on warp spinning, it is undoubtedly by the persistent trial of certain inventions, that the fact of success was practically demonstrated. Twisters, also, have been benefited from the inventions made originally for the warp frame, as they use similar spindles, rings, and travelers. The simplest and most efficient twister stop motion was designed by Mr. T. H. Smith, an American mill manager.

Coming to the spooler, we also find certain of the spindle inventions employed, also the American bobbin holder of Wade, the guide developed by Laflin, Northrop, and others, and certain modern novelties in knot tyers, spool lifters, steel construction, etc. I have recently seen a new design of belt spooler, adapted for the recent Clark bobbin holder, which drops an empty bobbin automatically to the belt, without necessity for the operative to remove the same by hand. I have also seen very promising experiments with a machine in which the spools are revolved by pressure against a traveling belt, which secures uniform surface speed, and therefore a higher average speed, enabling less spindles to be used, with less space to be covered by the operative, and less floor space consumed.

In warpers we have the stop motions of Walmsley, and others, the cone drive of Hicks, the beam doffer of Rhoades, and many important modifications for different uses, by Clark, Entwistle, Straw, Walcott, Denn, and others. Colored yarn demands extra processes, in which the chain dyeing process of Straw, as modified from the ideas of Gildard and Scrimgeour, has met with unvaried success. For colored filling yarn, the chain quilling machines, devised by Straw and Pratt respectively, have gone into extended use. Yarn used for hosiery and other similar purposes, is now wound on cones or cylinders, on machinery of American origin, including ideas of Wardwell, Foster, and others.

We thus find that the entire manufacture of yarn, from the roving to the cloth, has profited greatly by the attention of American minds.

Passing by the slasher, a purely English machine, we now come to the weave room, which, like the spinning room, can fairly claim to include nearly all its modern innovations under American ownership. The cotton power loom, of English origin, received its first change at American hands, by introduction of the self-acting temple, by Ira Draper, who made his first invention in this class in 1816. From this idea started a business which has grown into the present Draper Company. Before the development of this device, cloth was held stretched after being formed in front of the reed, by clamps, which had to be continually moved forward by the operative. The self-acting temple immediately allowed the weaver to run two looms, instead of one, thus making a gain equal at the time, in proportionate result, to the present gain of the Northrop loom. This temple was later improved by George Draper, by a form which is still largely used today, and still later by Warren W. Dutcher, who supplied the reciprocating feature, and also developed a remarkable system of automatic machinery for producing the parts. The filling stop motion is another important improvement claimed for America, although it is only fair to say that the English dispute this point. The first parallel picker motion was invented by the same Dutcher whose name appears on all our modern temples. The first automatic let-off was devised by Erastus B. Bigelow, the well known inventor of the first carpet looms. It was modified later by Bartlett, in the form now used by nearly every American loom builder. Other types of American let-off inventions are shown in patents to Shepard, Cottrell, George Draper, Thompson, Morton, and others. General Draper has recently effected a combination of principles, aided by another well known inventor, Mr. Charles F. Roper, which seems to

ent of changes in speed, and other serious variations in uniformity of affecting conditions. Pearl reduced size and weight, to lessen vibration, Sawyer provided a steadying upper bearing within the load, Rabbeth discovered the vital principle of a yielding bolster, Atwood made the whole structure yield, to meet the peculiar conditions of silk spinning, Sherman, Taft, and Woodmancy made important changes in design, and the various Drapers, and inventors under their charge, have perfected many important details. The speed of the old spinning frame was absolutely limited by the jar of the spindle above 6000 turns per minute, while with the modern structure I have seen a spindle turn at 40,000 turns per minute, with absolute perfection, which is, of course, much higher than we now ever expect that the rest of the frame can run. The change of speed from the common type to the Rabbeth type, not only increased production, but it attained this gain without proportionate increase of labor cost, power, or wear. The saving to the world by these inventions has been figured as worth $50,000,000.00 in benefit to this country alone, and it has also been figured that the modern high speed spindle enables one operative to equal the product of 10,000, or more, spinsters, using the olden spinning wheels of the type well known within the lives of many here present. It hardly seems possible to realize that the inventions of one century have lessened human labor in one line at the ratio of 10,000 to 1; but the facts are actually understated in this extraordinary assertion.

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In warpers we have the stop motions of Walmsley, and others, the cone drive of Hicks, the beam doffer of Rhoades, and many important modifications for different uses, by Clark, Entwistle, Straw, Walcott, Denn, and others. Colored yarn demands extra processes, in which the chain dyeing process of Straw, as modified from the ideas of Gildard and Scrimgeour, has met with unvaried success. For colored filling yarn, the chain quilling machines, devised by Straw and Pratt respectively, have gone into extended use. Yarn used for hosiery and other similar purposes, is now wound on cones or cylinders, on machinery of American origin, including ideas of Wardwell, Foster, and others.

We thus find that the entire manufacture of yarn, from the roving to the cloth, has profited greatly by the attention of American minds.

Passing by the slasher, a purely English machine, we now come to the weave room, which, like the spinning room, can fairly claim to include nearly all its modern innovations under American ownership. The cotton power loom, of English origin, received its first change at American hands, by introduction of the self-acting temple, by Ira Draper, who made his first invention in this class in 1816. From this idea started a business which has grown into the present Draper Company. Before the development of this device, cloth was held stretched after being formed in front of the reed, by clamps, which had to be continually moved forward by the operative. The self-acting temple immediately allowed the weaver to run two looms, instead of one, thus making a gain equal at the time, in proportionate result, to the present gain of the Northrop loom. This temple was later improved by George Draper, by a form which is still largely used today, and still later by Warren W. Dutcher, who supplied the reciprocating feature, and also developed a remarkable system of automatic machinery for producing the parts. The filling stop motion is another important improvement claimed for America, although it is only fair to say that the English dispute this point. The first parallel picker motion was invented by the same Dutcher whose name appears on all our modern temples. The first automatic let-off was devised by Erastus B. Bigelow, the well known inventor of the first carpet looms. It was modified later by Bartlett, in the form now used by nearly every American loom builder. Other types of American let-off inventions are shown in patents to Shepard, Cottrell, George Draper, Thompson, Morton, and others. General Draper has recently effected a combination of principles, aided by another well known inventor, Mr. Charles F. Roper, which seems to

make this class of device absolutely uniform in operation, from the full to the empty beam, never needing the slightest change in adjustment. Apart from these special features, however, the cotton loom, as a whole, has received no vital change in principle for several generations. In fact, many of us know of looms built over 30 years ago, which are still running in various mills, turning out a fair rate of product. In the line of fancy looms, however, there has been continual advancement, due to the inventions of Crompton, Knowles, Wyman, Hutchins, Stafford, and others. I do not pretend an intimate knowledge of this special class, and cannot, therefore, attempt to specify in detail in regard to the various ideas developed. It is perhaps sufficient to say that foreign loom builders have recognized the novelty of American ideas in these lines, by paying large royalties to their owners.

Returning to the cotton loom, it will, of course, be expected that I shall refer to the Northrop improvements, which have, of late, met with such remarkable success. In the limited time at my disposal I can hardly do the subject sufficient justice, and refer those interested in the details to a 100-page book which I have recently compiled, copies of which will be supplied on demand to those interested. These important novelties, which have led to a sale of more than 60,000 looms since 1895, cover the first successful use of an automatic filling changer, the first successful use of a warp stop motion adaptable for general cotton weaving, and the first successful device for matching the pick, and making absolutely perfect cloth. The filling changer has more than halved the weaver's labor, the warp stop motion has protected the cloth from warp faults, and the mis-pick device prevents faults in the filling on such goods as demand that grade of perfection. To illustrate the futility of attempting definite explanation, it is only necessary to state that there are over 200 patents already granted to our own inventors, to cover the detail of these combinations. Broadly speaking, the filling changer is an apparatus for supplying cops or bobbins of filling yarn to the running shuttle in a loom, whenever necessary, to keep the operation of weaving continuous. The warp stop motion definitely prevents the weaving of cloth after any one warp end has broken, and the mis-pick arrangement, in its perfected form, supplies new filling to the shuttle just before the former supply is exhausted, so that no short end or empty shed shall be shown in the cloth. Since the introduction of these special changes, many other radical improvements in loom construction have been introduced by the builders of the Northrop looms. Such include the high-roll take-up, which engages the cloth practically as soon as it is woven, to prevent shrinkage or wrinkling, and which allows the winding of a larger roll of cloth than usual, underneath. Also the change in construction, by which looms can be built all of one hand, instead of in rights and lefts, as formerly. One of the latest warp stop ideas does away with the former necessity for lease rods, by placing the detectors in a proper position to do the leasing themselves. Other loom builders have also brought out recent interesting features, such as the new Wyman shedding motion, of which we use a modification, know as the Lacey form. Also a certain novel combination of picking and shuttle box devices, invented by Charles F. Perham, have enabled experimental looms to vary remarkably in speed, without banging off. There are also many recent attempts to revive the often abandoned principle of shuttle changing on which we ourselves wasted much earlier energy. Of course, no inventions that have not been tested by continuous running under practical mill conditions, in large quantities, can be deemed sufficiently advanced for the practical mill man to take interest in them.

(To be concluded.)

WOOLEN DEPARTMENT.

Nature of the Wool Fibre in Relation to its Textile Treatment.

CHAPTER IV.

DAVID PATERSON, F. C. S.

We have already referred in our preceding chapter to the dangers of felting of the yarns, arising from too much handling of the wool, and also from over boiling while in the dyebath.

It is difficult sometimes to avoid these dangers, especially when the dyer is trying to match an exact shade, as the yarn has often to be lifted and re-lifted out of the dyebath, to enable fresh proportions of coloring matter to be added, in order to bring the dyed color to the required shade. As each fresh addition of dye requires a further boiling of the yarn in the dyebath, it is thus easily seen that even with the utmost care it is sometimes difficult to avoid undue boiling and manipulation of the wool.

Another factor in dyeing, which causes the wool to felt readily, is the presence of acid. Except under special circumstances, an acid, generally sulphuric or acetic, has to be added to the dyebath to act as a mordant, or assistant, to enable the dye to fix upon the wool. What the acid really does, is to gently open the external scales of the wool fibre (described in Chapter 1), and by doing so, the dye is thereby admitted into the centre of the fibre itself. The dye solution then unites with the fibrous cells which form the interior of the wool and is there fixed. This explains, no doubt, the poor, fugitive colors, which are produced, when no acid is employed in the dyebath. The internal fibres which constitute the whole of the inside of wool, possess a marked affinity for dyestuffs, especially the aniline dyes. Indeed, many of the aniline colors, such as magenta, malachite green, methyl violet and similar basic dyes are readily dyed upon wool without the assistance of any acid or mordant.

The degree of affinity for coloring matters depends greatly upon the different qualities of the wool. It is generally found, that the higher the lustre of the wool, the less the affinity shown for dyes. Thus a fine lustred wool resembles more the nature of mohair, alpaca and hair, which, though of a beautiful lustre, are difficult to dye. The non-lustre wools, such as merino, are more open in nature and dye much readier. The reason for this may be readily understood from what we have previously said in regard to the cause of lustre and non-lustre.

In a great many cases, wool has a greater affinity for dyestuff than silk, and this may be shown by dyeing small hanks of wool and silk in dyebaths containing some of the aniline dyes, such as naphthol yellow, or the natural dyestuff, indigo extract. If, after dyeing, the hanks be boiled in water with a little soap, it will be found that the colors dyed on the wool are much faster than those on the silk.

Dilute acids have little or no action on wool, even at the boil, but strong acid destroys the fibre completely. Wool seems to have the remarkable property of absorbing a certain quantity of dilute acid—sulphuric for example—and even after the wool has been repeatedly washed, it still retains the acid. Wool so treated can be dyed full shades with a neutral solution of the azo acid dyestuffs, without the necessary addition of acid to the dyebath. Under ordinary conditions the wool would not be thus dyed.

Wool can stand the action of acids much better than cotton, and on this fact depends the process of "carboniz-

ing" or "extracting;" i.e., the separation of the wool from cotton in rags containing both these fibres. The rags are steeped in dilute sulphuric acid, then dried in a stove, by which process the cotton is completely destroyed, and may be beaten out as a fine powder, while the uninjured wool remains.

The illustration, Fig. 1, shows the difference in appearance under the microscope of wool treated with acid.

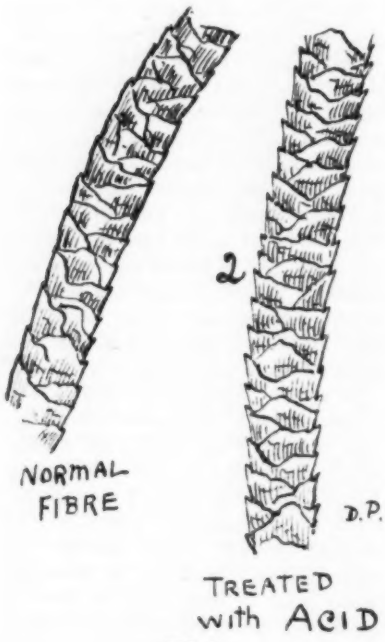


FIG. 1.

While 1 is the ordinary typical fibre, with the scales possessing their normal aspect, number 2 is that of the acid treated fibre, and shows the external scales opened at their free ends: their edges give to the outline of the fibre a more serrated appearance.

In speaking of the absorption of acids by wool, it may be of interest to remark here that sulphurous acid or sulphur dioxide (SO_2) is also readily absorbed by the wool fibre during the bleaching or "stoving" operations. Wool, therefore, that has been bleached by means of burning sulphur, must, before dyeing or printing, be treated with peroxide of hydrogen, or in some cases, a dilute solution of chloride of lime, in order to oxidize the sulphurous acid in the fibre into sulphuric acid. If this be not done, the colors will either not fix properly on the wool, or else they will become quite decolorized by the reducing action of the sulphurous acid.

The action of the hydrogen peroxide (H_2O_2) may be represented as follows:

Sulphurous acid present in the wool (H_2SO_3) + hydrogen peroxide (H_2O_2) = sulphuric acid (H_2SO_4) + water (H_2O).

The extra atom of oxygen present in the peroxide changes the reducing and decolorizing sulphurous acid into the not only harmless, but beneficial sulphuric acid.

In carpet yarn printing, however, no such oxidizing agents or secondary treatment are necessary, as the printed colors always have a certain amount of acidity (generally of sulphuric acid), which, during the steaming process, is sufficient to dispel the sulphurous gas absorbed in the wool. This explains the acid reaction of the vapor inside the steam chests where carpet yarns are steamed.

As a rule, yarns which are intended for dyeing are not bleached unless the colors to be dyed are of a very light, delicate character. Under such conditions, hydrogen or sodium peroxide is best fitted for the bleaching agent.

The exact chemical reaction, which takes place between the sulphurous acid of the bleaching chamber, and the natural yellowish coloring matter present in the wool, is still a moot point with chemists. Some consider that the sulphurous acid combines chemically with the coloring matter of the wool, producing a colorless compound; while others suggest that the reaction is purely one of reduction, the sulphurous acid reducing the coloring matter into a colorless leuco-compound. The decoloration is not altogether permanent, as the yellowish tinge natural to the wool may be reproduced in the white bleached wool by steeping it for some short time in dilute alkalies, such as soap, or carbonate of soda, when the original brownish tint comes back.

The property of absorbing sulphurous acid, shown by the wool fibre is, in many cases, a drawback; as, when sulphur-bleached yarns are interwoven with fancy dyed threads, the colors are sometimes bleached by coming in contact with the sulphured yarns. This, however, may be remedied by treating them in a dilute bath to the oxidizing action of hydrogen-dioxide, when, as we have just observed, the sulphurous acid is converted into sulphuric.

(To be concluded.)

Finishing Flannel Suitings.

There is a well defined demand for a class of flannel suitings, which the finisher finds himself especially interested in, if he intends to keep up with the market of today. While these goods are not quite so easy-going as what are commonly called outing cloths, at the same time they are not so substantial, or so carefully finished as light-weight cassimeres and other summer woolen suitings. As to their character, they are necessarily soft, and to a certain extent clinging, and yet the finish, which they receive and maintain, must be more or less carefully imparted.

As to colors and shades, in which these goods appear, the range is exceedingly wide. The delicate shadings of cream, straw, pink, and blues are much used and dark shades with fancy striping are in demand. The stock of which these goods are made must necessarily be of a fair quality, not only because the goods themselves demand it, but because the yarn must be spun down very fine, in order to bring about the desired results.

In the construction of the goods, and in their management in the loom it is necessary that warp yarns should be more heavily sized than is usual. This sizing must be so made that it will dissolve quite easily, since, if it were necessary to resort to harsh measures in order to remove it, the result would be that the quality and feel of the fabric would be affected. In order therefore to produce the feel that is desired, and at the same time in order that the finishing may be properly done, the size must be quite soluble. If this matter is neglected and the ordinary quality of sizing material is used on the warps, evils will be produced that cannot afterward be rectified.

The initial process is of course the burling and sewing; this is followed by the fulling. A good bodied neutral soap is to be used in the fulling, and the process should be extended as much as possible without being too severe at any time in its action. The cloth should be shrunk in length and in width, but it must not be allowed to draw up so much as to make the fabric narrow when the finishing process is complete. The purpose of the fuller ought to be to get all the felt that he possibly can without sacrificing width, feel, or softness of fabric. In order to do this, on twenty-seven inch goods an inch and a half at least ought to be allowed, as it will require this much to have the goods finished right. It is suicidal to finish these goods by means of stretching, as the amount of shrinkage, when the cloth is worn, nearly destroys its wearing qualities.

The fulling is now succeeded by the scouring; the goods are run into the washer with a bath of water at about 115° F., and 2 per cent. of soda is added to the liquor. After a half-hour's run the water is let off, and a light bodied soap is added. This soap must be fairly strong, and enough warm water must be added to admit of a thorough saturation. In fifteen minutes the loosening should begin, and the lather should look all right. This is next followed by another application of soap, less of which is used this time and more water. A quarter of an hour in this bath and the cloth ought to be ready for rinsing, but do not rinse with cold water, for it is never well to go from one extreme to the other at once. Start the rinsing with warm water, gradually lowering the temperature. When

cold water is finally used, the length of time necessary to rinse the cloth will depend on the amount of water at the finisher's disposal and the character of the stock on hand. Besides this, certain soaps are more easily rinsed away than others. Fuller's earth in a liberal solution should follow, and then after another washing the goods may be extracted and dried to width required.

The shearing must be fairly close and smooth and even; four or five runs will ordinarily answer, and the pressing follows, which must be done with the face of the goods upwards to impart the necessary press finish, and prepare the goods for the steaming, unless there is a steaming apparatus in connection with the press. The press finish must be steamed off in some way, because the gloss and lustre are not among the things that are desired in this class of goods.

Mixing Low Stock.

The foreman over this department should see that the various classes of colored rags are so blended that each kind, whether black, blue, red, yellow, white or gray, loses its own identity, while in the process of being picked and made into mungo. This is not only essential for good mixing, but equally essential for blending the various staples, which different rags produce, thereby giving a more regular and even staple in the bulk.

These remarks also apply to other materials, which are often used in making this class of cloth, such as twist thread, or hard fibres of any kind. These should be put through suitable machinery and brought into a soft state, which will assist them to blend more easily with other materials.

All materials should be prepared and brought into a suitable condition, before the blending process is proceeded with. This preparatory process I would lay great stress upon, as it cleanses the material from dirt, grit and other matter, and makes it much easier to handle in the after process.

The room in which these various parcels are blended is of as much importance as any room in the factory, although often regarded otherwise, and frequently any dark room is made to do service for this initial part of cloth manufacturing. The room should be large, well ventilated, and where possible, lighted from the top. It is a mistaken policy to suppose that any sort of old and worn-out machinery, if there be a tooth stuck in the wood at all, will answer. The willey place and its machinery, I feel sure, have not received that due consideration at the hands of manufacturers, which they deserve.

The system upon which this blending process is often carried on, is get it in, and get it out, as soon as possible, no matter how it is done. Great mischief often results by the stock being rolled together instead of being mixed, which makes it much more difficult for the next process, which is carding. The machinery mostly used in the mixing room, is a shake-willey, or duster, and a Fearnaught picker. The methods adopted for blending the various materials vary according to the nature of the materials used for the cloth which is being made.

I entirely disapprove of the very general practice which is adopted, of putting layer upon layer of the different kinds of materials which are being used. The shortest staples are always making for the bottom, which renders it difficult to maintain regularity, and this is best assured by adopting the following method.

First, pass the wool and cotton (blended together) through the willey, and then blend nippings, or any other waste or shoddy, with the cotton and wool, and pass them mixed together through the Fearnaught. Then commence what I consider to be the best method of mixing; this is done by putting a proper proportion of the mungo, or shoddy, the wool and the cotton,

which have been previously blended together through the willey. By this means, the long and short materials are so amalgamated that the short cannot be separated from the long; after which, pass the whole blend through the Fearnaught, once or twice, as the case may require.

This method of mixing is best accomplished by the use of the automatic feed and self-delivery willey, and the Fearnaught with the self-feed. Blends made by this method produce a very neat and even mixture of cloth, and in the case of goods finished in self-colors, a much more satisfactory result is obtained. I am fully conscious that a great variety of opinions prevail upon the question, as to which is the best system of blend-mixing, but from the long experience which I have had, I have arrived at the conclusion that no method will surpass that of preparing each class of material separately, by bringing it into a soft and suitable state, where fibre will more easily aessociate with fibre, and mix with each other in such a manner that each material of distinctive color will lose its identity in the bulk. This is best done by the process which I have just described.

ECONOMY.

Designing Fancy Cassimeres and Worsteds.

ARTICLE I.

FRED BRADBURY.

The continual effort of the designer, salesman and manufacturer is to produce something new and attractive. This is their ambition, because they are repeatedly confronted with the demand for something new or different from what they have hitherto submitted. Solomon wisely said, that there was nothing new under the sun, which in the abstract is possibly true, yet it will be granted that there are various ways of combining and arranging old things so as to produce new combinations, and consequently very different and new effects according to modern interpretation.

In the production of fancy worsteds and woolens there are numerous standard effects obtained by weave and color, which will probably never pass into oblivion, hence a knowledge of good standard simple effects is useful and advisable, not only because of their simplicity and neatness of appearance, but because these patterns, which are good in their simplest form, will most probably meet with favor and find a ready sale when used in combination to produce new designs.

Strictly speaking, all novelty is simply a combination of old principles arranged according to the individual tastes of the designers.

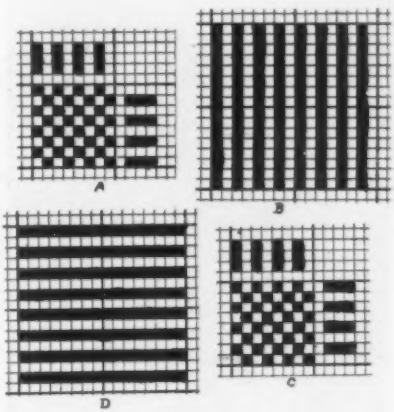


FIG. 1.

Keeping the foregoing in mind then, it is proposed to submit a few types and makes of cloths, together with the effects produced, when regular principles of coloring are brought together and combined to produce special neat and effective styles of woven structures.

When the design given at Fig. 1 A is woven with the warp arranged 1 thread dark, 1 thread light, and the weft is inserted in the same order, 1 thread dark, 1 thread light, the effect produced is fine lines alternating dark and light running lengthwise, as shown at Fig. 1 B. Should, however, the weft be inserted in the order of 1 thread light, 1 thread dark, Fig. 1 C, the

woven structure shows transverse dark and light lines, as illustrated at Fig. 1 D.

The guiding factor in the production of longitudinal and transverse lines of dark and light colors, whether they are of two or more colors, is that each color of weft must pass over its self color of warp in the production of longitudinal lines, and that each color of warp must pass over its self color of weft, in order to produce transverse lines; so that, by changing the weave plan into what is technically known as the "opposite foot," or by commencing the warp or weft with

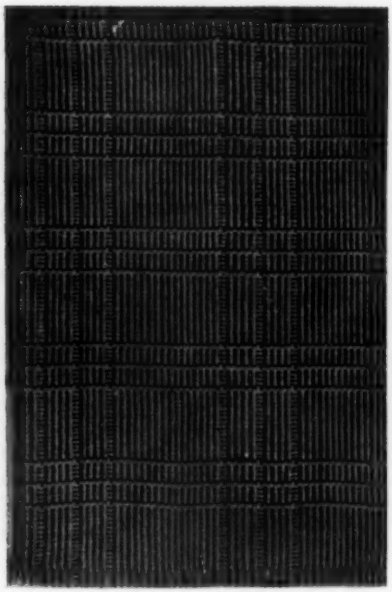


Fig 2

the light instead of the dark color, a change from one style of effect to the opposite is possible. See Figs. 1, A and C.

At Fig. 2 a neat over check is illustrated by a photograph of a fine light weight fancy worsted. The effect is produced by a judicious combination of the longitudinal and transverse lines referred to previously. The weaving particulars and details of make are tabulated below, which for convenience of reference will be called Cloth No. 2.

Warp 2/48s, Botany 24s, Reed 2s. Reed width, 63 inches. Finished width, 56 inches.

Weft 2/48s, Botany 44, picks per inch.

Finished weight per yard 8 to 9 ounces.

WARP PATTERNS.

1 dark brown 1 white	32 threads
1 white 1 dark brown	2 threads
1 dark brown 1 white	8 threads
1 white 1 dark brown	2 threads
1 dark brown 1 white	8 threads
1 white 1 dark brown	2 threads

Total, 54 threads in 1 repeat

Filling as warp. Weave as Fig. 1 A.

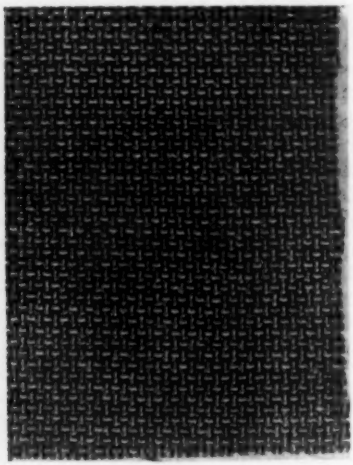


Fig 3

To the same make of cloth as No. 2 and weave as at Fig. 1 A, but when the colors used for the warp and weft are respectively,

1 thread black
1 thread white
1 thread black and white twist

a very different, but yet a simple and effective style of woven fabric is produced, a photographic illustration of which is given at Fig. 3.

When the 1 dark, 1 light principle of coloring is used in a cloth, whose

weave structure is the cassimere twill as given at Fig. 4 A, a neat step effect of pattern is the result, as shown in the illustration at Fig. 4 B.

This basis of coloring makes the effect in the cloth illustrated at Fig. 5.

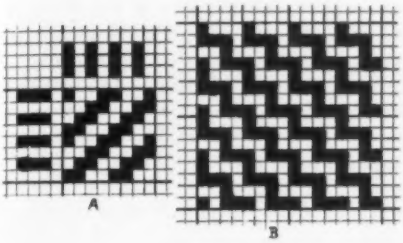


FIG. 4.

The cloth is light weight. The particulars of make are as follows:

Cloth No. 5.

Warp 2/36s, Botany 15s, Reeds 4s. Reed width, 64 inches. Finished width, 56 inches.

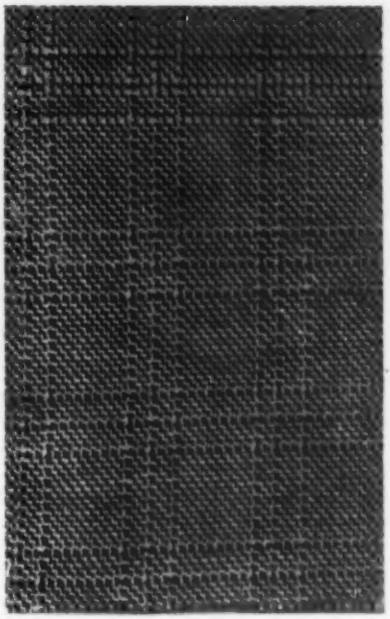


Fig 5

Weft 2/36s, Botany 60 picks per inch. Finished weight per yard 12 ozs.

WARPING PARTICULARS.

1 thread navy 1 thread white	32 threads
1 thread white 1 thread navy	2 threads
1 thread navy 1 thread white	8 threads
1 thread white 1 thread navy	2 threads
1 thread navy 1 thread white	8 threads
1 thread white 1 thread navy	2 threads

Total, 54 threads in each repeat of the pattern

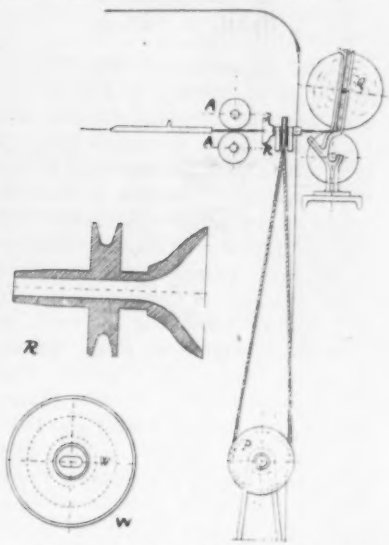
Filling as warp. Weave as Fig. 4 A.

(To be continued.)

Device for Taking the Place of the Rubbing Aprons in French Worsted Drawing.

A French worsted spinner, M. Brulle of Tourcoing, has invented an attachment for worsted drawing frames, which does the work of the rubbing aprons, employed in French worsted yarn manufacture.

The roving, after coming from the delivery rolls A A, passes through the ring on sleeve R, of which a cross section is shown at W and a longitudinal



Condenser for French Worsted Drawing.

section at R. The hole in this ring is elliptical, so as to cause the ribbon of wool to revolve with the ring. This ring is revolved by the belt from the drum P, which turns first in one direction, and then in the other.

This alternating motion twists the roving for a certain distance to the right, and then for an equal distance to the left, as it is wound on the spools Q.

The advantages claimed for this attachment are:

1. Increase of production, owing to increased speed possible with the new method.
2. Saving of power.
3. Saving of waste.
4. Avoids expense of aprons.
5. Less complicated mechanism required.
6. Less spools required as roving is more compact.
7. Can handle different grades of stock with less trouble.

It is said to be now in practical operation on a large scale in the spinning mill of the inventor at Tourcoing, France, and it is the intention to have it placed on exhibition at L'Institute Technique Roubaisien at an early date.

Mohair in Turkey.

United States Consul, Milo A. Jewett, at Sivas, Turkey, in a recent report, says the increased attention given to the keeping of Angora goats in the United States has suggested to him the propriety of making a few remarks on this industry in Turkey. The city and province of Angora lies west of the Sivas province, and about 250 miles southeast of Constantinople. It is a country resembling the State of Colorado, mountainous, rocky, sparsely wooded, and poorly watered. The 40th parallel of north latitude passes very near to Angora, Turkey and Denver, Col. The winters are cold and rather long. Snow is abundant. From May to September, little or no rain falls. The world's supply of choice mohair goats is drawn from the western part of this province, and also from the province of Castamouni, lying north of Angora. Angora goats raised in any other part of the world would probably require a periodical infusion of new blood, from this Angora stock, in order to preserve the race true to the original. The best class of Angora goats is not found at Angora itself, and in recent years purchases for export have been made at Gerede and Kibriz, in the Boli district. Mohair goats are raised in other parts of Asia Minor, but sufficient care is not given to breeding and raising, consequently the race is inferior. Perhaps climatic and other natural conditions also make the breed less desirable in other regions. Even where the Angora goat is found at its best, its raising is left largely to chance and to nature. The average fleece of mohair from choice picked Angora goats, 2½ to 3½ years old, is 9½ pounds for males, and 5½ pounds for females. The yield from choice goats, without selection as to age, that is from 1½ to 4 years old, is about six pounds for males and four pounds for females. Third class goats will average about four pounds of wool a year. Angora goats of the best class, 2½ to 3½ years old, are valued at about $18 for males and $7 for females. The average choice of best he-goats, without selection as to age, is $15, and she-goats, $6. In some cases a particularly fine buck may go as high as $50. The above prices do not include commissions or other charges. Angora goats cannot be exported from this country without an Imperial permit. Such a permit is difficult to obtain. It requires time and considerable money. It should be obtained at Constantinople, before the goats are purchased for export. A certificate of health is also desirable, and sometimes necessary, before a permit is paid for. Probably a permit for export may be obtained more readily and cheaply by some Ottoman subject, than by a foreigner through his diplomatic or consular representative.

—A cause of spotting is moldiness. In hot weather mold is very apt to form on stuff left lying damp, and especially with those light colored ones that are the most prone to betray it.

KNITTING DEPARTMENT.

The Knit Goods Situation.

The sharp divergence, that frequently exists between theory and facts, has been shown within the past month by the disposition to cancel fall weight orders for fleeced goods, which were not duplicates, although the prices at which they were taken were lower than anything which can be named now, or even before the sharp rise in raw cotton late in June. Overproduction, however, has in part neutralized the benefit of this rise.

While July temperatures have been more reasonable and equable than June, they have scarcely been as favorable as could be wished. Orders for duplicates have been slow. There is only one common sense interpretation to put upon this showing, the trade has been overbuying for nearly a year and is now waiting for the demand to catch up.

Prices have been held unusually well, all things considered, and the stiff lip maintained gives promise for the future. This firmness has given rise to absurd talk for prices of light weights for next spring's delivery. The quotations set by the other side are equally absurd. Why not take a middle ground?

Salesmen have not gone out as early on spring orders, as was talked of in June; the shift in plans has been decidedly for the better.

To put the situation on light weights negatively, it might be in vastly more unhealthful condition. Things have cleared up a good deal with concessions on both sides. The outlook is plainly enough for prices slightly advanced over last year.

If there had been much accumulation of light weights, there would have unquestionably been some break. About all the reduced production is being placed. There is a pronounced feeling, too, that mid-summer will bring an opportunity to close out light weight stocks.

This is the time for athletic goods, which are shown in unusually handsome colors, cardinal wine, navy, scarlet and combinations. Their trimmings are unusually tasteful.

The other most seasonable lines are in wash goods. The linen makes are fine, but too high priced for general use. It would be worth while for, say, several well-known men in the trade to experiment with worsteds in this direction.

Turning to hosiery, Chemnitz advices are still strong, although it is plain that manufacturers are catching up somewhat on orders. The difficulty in getting help is now chiefly in the finishing departments.

Mercerized hosiery is in decreasing request; not until its prices and finish are different will it be really popular. Embroidered styles are as actively demanded as ever.

There is a feeling that there will be some decline in prices in the fall, but the chances are it will be so late as to cut little figure on next season's business. Still, some buyers are waiting with this notion in view.

General business in hosiery has been better the last two or three weeks than is usual at this between-seasons period, while the importing trade lasted later than commonly, prices being held steady to the very end.

Lace hosiery continues in exceptional demand and as stocks are not large, some hardening of quotations is among the possibilities.

Wool, worsted and merino lines for fall account have done excellently.

Colors are one of the hardest points upon which to predict. Of late, in particular, fewer fancies for women are bought than for men. It is expected that purple, wine, lilac, green and dark blue will be the reigning colors for the fall trade.

Knitting Machinery Exhibits at the Paris Exhibition.

Specially Reported for the Textile World by J. Henry Quilter.

England being the home of the stocking frame, a visitor would naturally turn his steps to this section should he be interested in knitting machinery, expecting there to find the latest improvements more especially in machines having the spring or bearded needle. Should his particular ideas be the latch needle machines, especially of the circular knitting machine type, he might first find out the American exhibits of machinery with the hope of seeing the latest developments of this class of machine of which so many types have lately been introduced to the world trade.

Disappointments awaits such visitor, for in neither section named will he find any knitting machinery. Not only to his own surprise, but to the surprise of many visitors, these two countries are not exhibiting knitting machinery of any kind. The only exhibits of this class are those of France, Germany and Switzerland, each of which are in the textile section of each country in the "Palais des Grandes Industries," in close company with the exhibits of each country's hosiery.

There is no "Machinery Hall" as is usual in such exhibitions, the machinery and the manufacturers' sections being in the one department. This is no doubt due to the ease with which machinery can be driven by electric power which dispenses with the details of shafting, etc., which is necessary when steam power is used.

The French section is the first reached on entering the building from the Pont d'Iena end, and the exhibitions in this section are: The Societe Generale de Bonneterie, G. Lebocey, Bonamy & H. Beylard & Cie. The "Societe Generale" are showing their special build of rotary frames on the principle "Cotton" for both plain and rib goods, including a special machine for making openwork designs or lace hosiery. A rib rotary frame (principle Onions), is shown with special thread laying appliance for laying warp thread in conjunction with the usual weft threads, so making rib tops in fancy warp and weft knitted design, including "plaids," etc.

G. Lebocey Successeur are exhibiting circular machines on the French system, each showing some special system of this firm, as their special striping arrangement for putting into action any particular thread of a number for any desired number of courses. The principal machine of interest was one for making a special cloth, having elaborate designs in color stitch produced by the controlling of the threads and the various special mechanisms by electricity. The sample of cloth seen by the writer much resembled "Tapestry." Machines with special mechanism for producing tuck and other designs are also exhibited.

Bonamy also exhibits circular machinery. Beylard & Cie exhibit their special system of motor for driving by power all kinds of knitting machinery.

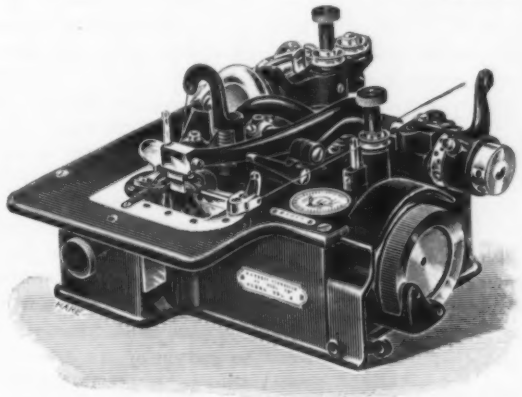
In the German section are the more interesting exhibits. Here G. Hilscher of Chemnitz is exhibiting his new system, the "Cotton-Hilscher" of rotary machinery model 1900. Since the introduction of this class of machine by Wm. Cotton of Loughboro, England, in 1864, improvements have been added by numerous builders, until their present number is almost legion. Most of these have dealt with increasing the capabilities of the machine, production being increased by increasing the size of the machine. G. Hilscher has in this new machine altered the system of knitting, this fact making it more interesting for a deviation is made in the knitting movements, as part of the work, usually done by the needle and sinkers, is in this machine done by the knocking-over sinkers. In this machine the sinker has nothing to do with the keeping movements, and the needle bar has no lateral motion dur-

ing the process of beating off and keeping. This work is done by the knocking-over bar, the sinkers in which have a keeping hook; the knocking-over bar has a special movement swinging laterally backward and forward against the needles.

(To be continued.)

The "Overlock" Seamer.

A machine, whose employment in underwear mills has been steadily growing for the eight years since its introduction, possesses merits which can not be gainsaid. The "Overlock" machine, made by the Willcox & Gibbs Sewing Machine Co., 658 Broadway, New York, answers to this description.



WILCOX & GIBBS "OVERLOCK" SEAMER.

It is made in many forms to suit different classes of work, not only for underwear and hosiery, but also for overedging lace curtains, ribbons, flannels, wrappers, and other knitted and woven fabrics. This machine, shown in the illustration, seams, trims and covers at one operation, making 3000 stitches per minute, at a very low cost for labor.

The machine makes the elastic overseam with a strong double thread stitch and smooth finish, and the artificial selvage produced is strong, and neat in appearance. This overseam is required on all underwear for the United States army and navy and also for the German army.

The United States consul at Nottingham, England, writes under date of July 26th, 1899, to the State Department, as follows:

"The 'Overlock' stitching device of Willcox & Gibbs has had a phenomenal success since the date of its introduction, about four years ago. Some eight or more different types of this machine are in use, for application not only to hosiery, but to the edging of lace curtains, and a number of specialties. The keen competition among manufacturers has necessitated its use, both as a matter of economy, and to improve the character of output for a discriminating market."

All parts of the machine of any one class are interchangeable, and experience has shown that the cost of repairs is merely nominal. The Willcox & Gibbs Sewing Machine Co., is an old established house, whose product is of the highest class.

Bleaching Knit Goods.

(Continued from July.)

An experienced and practical bleacher of cotton knit goods says:

My method of bleaching cotton knit goods is as follows:

After boiling out thoroughly and washing, prepare a bath of convenient size to hold about 500 lbs. "of goods" with chloride of lime at the proper strength. "See particulars hereafter."

The goods are then scattered loosely in the bath, and occasionally turned over or agitated with a pole. After laying in this for the necessary length of time, the liquor is drawn off into a reservoir tank, placed at a lower level, and kept to be replenished for subsequent use.

The bleaching tank is then refilled with water and the goods poled again. This washing operation is repeated once more.

Then follows the souring process in the same tank, and manipulated as before. This liquor can be kept and replenished or not at the option of the bleacher. Then follows the washing, "two waters" as before, the first preferably at 120 degrees, the second cold. The goods are then thrown out into trucks and conveyed to the soaping and tinting bath, which may be both combined in one operation if the previous operations have been carried out with due care.

The advantage gained by this method is that the goods don't have to be repeatedly lifted from one process to another.

The reason given for not resorting to labor saving machinery is, that it is very essential that the goods be not drawn out of the original shape, in which they came off the knitter. These conditions have never been complied with, when the goods have been linked together for continuous passage through machines, as is often done in bleaching knit goods in the piece and in skein yarn bleaching.

Personally I believe that all these operations can be mechanically carried out advantageously, and the shape of the goods not injured by the use of the revolving washing machine, or some similar apparatus.

In reference to bleaching mixed goods, cotton and woolen, I am not familiar with anything that will accomplish this except peroxide of hydrogen, and my experience with this agent has been only experimental. However I got a nice white, and believe it is superior to the old processes, though the cost is materially higher.

In bleaching knit goods, it is important to preserve the elasticity of the goods and have them retain a soft handle, and the preparatory process of cleansing the goods has a great effect on the success of the bleaching operation.

It is generally conceded that a certain amount of alkali is beneficial in boiling out the goods, as it increases the solubility of the impurities generally present in cotton, and while admitting this to be correct, I know that in many cases too much importance is given to the alkali and not enough to the duration of the boil. Oftentimes far too much alkali is used in the belief that the time of boiling can be lessened; the result is that the elasticity of the fibre is impaired. My own opinion is that the action of a strong lye boil on the cotton is analogous to mercerizing. The following method, which is one I prefer to follow closely, is very safe, and will give a clear white, without any perceptible, or very slight loss in tensile strength, and the cotton retains its elasticity in a greater degree than by any method I am acquainted with.

Formula for bleaching Peeler cotton goods.—Boil 12 hours with addition of 3% soda ash. Then wash thoroughly to get rid of the dissolved impurities. Enter chloride of lime bath at 1° T. Lay for 2 hours. Wash thoroughly and enter sour bath, sulphuric acid, at from ½ to 1° T, and wash thoroughly; first wash, warm, if possible, about 120 F., then soap and tint to shade.

For Egyptian cotton.—Proceed as above except the soaping and boil a second time with 1% soda ash 4 or 5 hours, then wash, chemic, and sour as before.

Bleach.

The apparatus employed for bleaching knit goods is generally made to suit the peculiar conditions in each mill. The hand method has the advantage that handling, to which the goods are subjected, can be varied to suit the different fabrics, although machines are made to handle piece goods,

and consist of a succession of tanks and squeeze rolls.

In the method mentioned by "Bleach," the liquor could be handled to advantage by using centrifugal pumps for carrying the liquor from one tub to another.

Circular Knitting Machine for Open or Lace Work.

A sample of an open work knitted fabric, made on a machine recently patented by J. H. Sprowles of the Standard Machine Co., is shown in

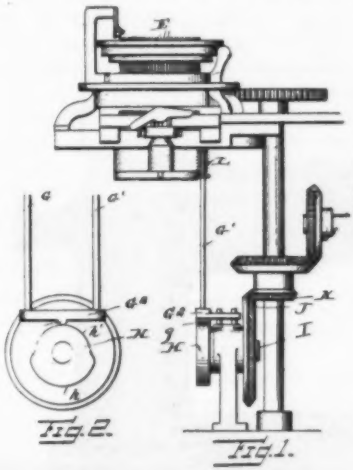


Fig. 2.

Fig. 1.

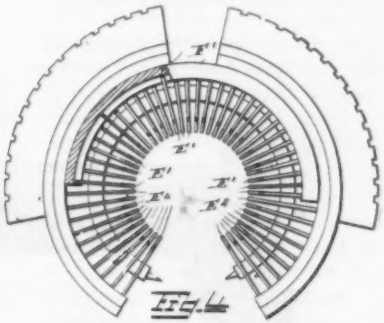


Fig. 4.

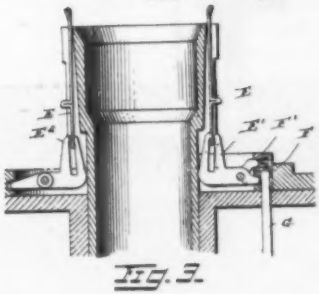


Fig. 3.

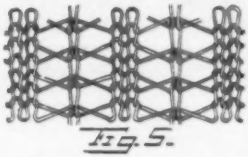


Fig. 5.

Fig. 5. This open work is formed by knitting a series of wales, then omitting one, and then forming a wale, in which the stitches are formed at each alternate revolution of the machine.

Fig. 1 is a side elevation of this machine; Fig. 2, detail view of cam for controlling needles; Fig. 3, section through needle cylinder; Fig. 4, plan view of needle lifting mechanism.

In order to form open-work or lace fabric by this machine, the mechanism or connections of some of the levers E′ is changed in the following manner: Taking a group of five levers, which will make one complete repeat of the lacework, the first two are connected to the plate F in the ordinary manner. From the next lever the needle is removed. The tail of the next lever instead of being connected directly to the plate F is connected to the plate F′, which plate F′ rests upon the plate F when the needle is in action. The needle from the next lever is removed. This completes a repeat of the needles to form one repeat of the lacework.

The plate F′ is connected to the rods G G′, which rods G G′ extend downwardly loosely through the plate F and are connected at the bottom by the cross-piece G^2, having a projecting portion g, which rests upon the cam H, having a high portion h and a low portion h′. This cam H is on the shaft I. This shaft I has a bevel-gear J, which meshes with the bevel-gear K on the shaft b. The relation of the bevel-gears K and J are as one to two.

The spring L is confined to hold the rods G G′, and with them the plate F′, down against the plate F. In one

rotation of the cam H the rod will be elevated and depressed. The cam H revolves once for every two revolutions of the machine, and thus the levers E′, which are controlled by the cam, are alternately turned in and out of action with the successive revolutions of the machine.

In a repeat two needles are at all times in action, the next needle is at all times out of action, the next needle alternately in and out of action, and the fifth at all times out of action.

A New Drawer Strapping Machine.

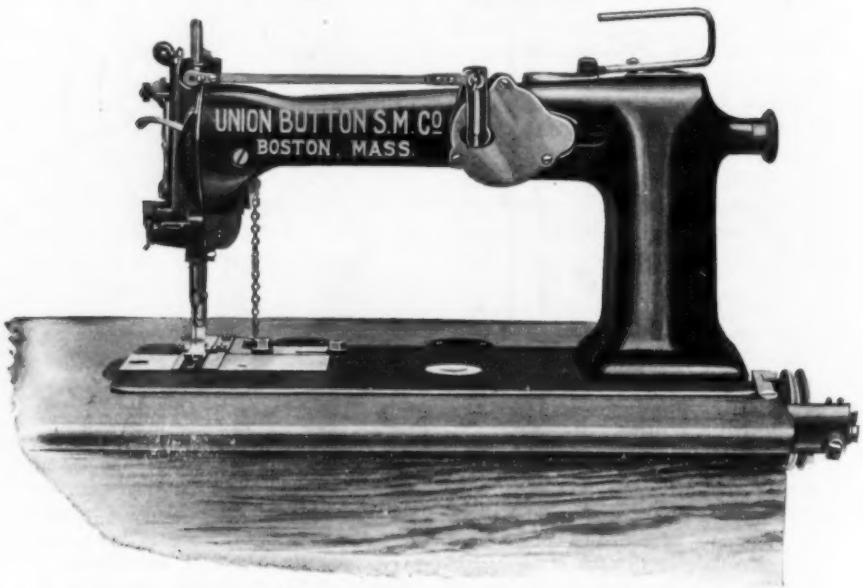
The manner of sewing suspender straps on men's drawers has not been a credit to underwear manufacturers in general. This was excusable on their part, because when straps were first sewed on, almost any machine that was idle was pressed into service, and even then it lay in the operator's power to put in as few or as many stitches as she liked.

Now that machines are built especially for this purpose, there is no excuse why suspender straps cannot be sewed on to drawers properly and securely.

The machine illustrated is especially designed and adapted for sewing suspender straps on drawers, and for making stays or bars at the required places in union suits and ladies' vests.

This machine will sew on straps of any width and thickness, can be adjusted to secure wide or narrow stitching across the straps, and will also bar each end of the stitching. It makes a perfect lock stitch; silk, cotton or linen may be used, or silk may be used for the outside and cotton for the inside, making a saving in silk.

The operator cannot slight the work, as the machine has an automatic stopping arrangement, which completely controls the number of stitches put into the work.



When the machine is "set" to sew on a strap of a desired width, the operator has simply to place the work in its proper position, and start the machine by pressing on the treadle; the machine will then put in the predetermined number of stitches, bar both ends of the sewing, and stop itself with the needle up out of the way. By this means the same number of stitches will be in every bar on the strap.

This machine has the same positive stop motion as that used on the Union button sewing machine, and is substantially built, by the same workmen, which ought to highly recommend it, inasmuch as the Union Button Sewing Machine Co., 164 High St., Boston, has been long and favorably known by the knitting trade. While it is a new machine, so to speak, it has long since passed the experimental stage, and been adopted during the past two or more years by many of the leading manufacturers of underwear, among whom are included: Joseph Simpson Sons, Canada; Penman Mfg. Co., Canada; Cooper Mfg. Co., Bennington, Vt.; Tiffany Bros., Bennington, Vt.; H. E. Bradford & Co., Bennington, Vt.; Roxford Knitting Co., Philadelphia, Pa.; Robert MacKinnon, Little Falls, N. Y.; Bristol Mfg. Co., Bristol, Conn.; Oneita Knitting Co., Utica, N. Y.; Utica Knitting Co., Utica, N. Y.; Ormsby Textile Co., Waterford, N. Y.

Power Sewing Machine Tables.

With the increase in speed of sewing machines used in the manufacture of knitted underwear, came the necessity for more solidly built tables, though one might say that a better knowledge of what was required has been an important factor in substituting the three-inch plank table, now generally conceded to be the correct thing on which to fasten such machines, in place of the one-inch board "bench," with almost any old piece of scantling for legs and cross pieces, which prevailed in the early days. In those days, it was called a bench, and the name still goes with the old-time sewing machine fixer, if perchance there be any left. As good light is necessary to operate sewing machines, the bench was commonly built close up to the wall, in which were the windows, though this gave but one row of machines. Some of these benches were so narrow that an operator could easily touch the wall to which, and the floor, the benches were fastened. Probably this manner of fastening fostered the name of bench.

To-day, the up-to-date table is built about four feet wide, whatever length circumstances call for, has well designed legs of cast iron, with adjustable self-oiling boxes for the shaft to run in. For the top, a good clear white wood or pine plank, two or three inches thick (the thicker the less vibration), about 12 inches wide for each side, with thinner material between, well joined and fitted, with a good, smooth, shellac finish, a drawer for each operator, skirt guards, adjustable to large or small diameters of pulleys by swinging brackets, to prevent skirts being caught around the shaft, and has a row of machines on both sides, with room enough between the wall and the table, which is easily fastened to the floor with lag screws, for one to pass between the wall and an operator sitting at her machine on the inside edge of the table. This gives light for two rows of machines, instead of one row, as formerly with the bench. These up-to-date tables can be obtained complete, ready to set up with shaft the desired length, and pulleys to connect with driving shaft, at a surprisingly low cost per foot.

Many prefer to build their own tables, their prime object being to get a table that will do away with the jar or vibration. A table built from the following description will do away with the most of it. The proper height is 29 inches from the floor to the top of plank, which should be not less than five inches thick, and from 14 to 16 inches wide, of soft, clear pine, the softer, the less jar. The space between the two planks can be filled in with thinner material about ⅞ or 1 inch thick raised up flush with the planks. The width should be about 4 feet, 6 inches, over all. The legs should be 4 feet 6 inches apart; the best legs are of iron and are made especially for tables of the above description by one or two concerns in the iron business. They are adjustable, with shaft boxes

attached. With such a leg there needs to be a cross piece on each leg to fasten the plank to, about 3 by 4 inches, the full width of the table, with the ends rounded off from the under side and chamfered. When this is constructed in a workmanlike manner, and well fastened to the floor, it has been found to be the most superior table for a knitting mill, the machines running better, at a higher speed, and with less repairs, because of the well known fact that the firmer a machine sets on the table the less will be the vibration, which, of course, means a longer lease of life to the machine and a minimum cost of parts.

When the table is ready for the machines to be installed thereon, an excellent way, after deciding where the machines are to be located on the table, is, if there are several alike, to lay out in the usual manner for the holes for the transmitter or motor, and the machine and belt. After it is found, by fastening and belting up the machine, that everything runs as it should, remove machine and transmitter, and for each make a template from the holes just made in the table, using the edge of the table to go by, for the machine, and the edge of the table and machine screw bolt hole, for the motor. After boring the holes and belting up the machines, every machine of that kind on the table will be in line, present a workmanlike appearance and run smoothly. The shaft under the table, which should be 1 3/16 inches in diameter, will be in line with the edge of the table, if the table is built in a workmanlike manner and the shaft itself properly adjusted. Where formerly round belting was almost entirely in use from table shaft to motor or transmitter, increase in speed and heavier running machines have made it more desirable to use flat belting and flat pulleys on the shaft and the driven side of the transmitter.

The short belt between the motor and machine is almost always round, and on types of machines fitted with tight and loose pulleys, or automatic stop-motions, where the belt runs direct from the table shaft pulley to the pulley on the machine, heavy round belting is desirable for obvious reasons.

The old solid pulley is, or ought to be, out of date, the ease and dispatch in putting on a split pulley making it more durable and economical.

It will be found to be an advantage to all concerned to shellac the top of the table often enough to keep it smooth, during a shut-down presumably being a good time. Then the goods can be handled faster and more easily, which, of course, means a greater production.

Many, and some ingenious, arrangements have been put in use to hold the spools, or cones, so that the thread will pass from spool to machine without hindrance. One of the best arrangements is to run a board the whole length of the table, about as high as the operator standing up can reach, to place the spool and spool-rest on. It is preferable that this board should be substantially supported from the table itself, instead of being suspended from the ceiling, unless the swinging tendency can be avoided. An arrangement like this will prevent a considerable amount of annoyance, like thread breaking, skipping, and poor tension, caused by goods being thrown on the table against the cone or spool, and various other like causes, will ensure a free running thread, and relieve the machine of a great many troubles that were really not of the machine itself, but caused by something accidentally coming in contact with the spool or cone, preventing the thread from coming off evenly. The power sewing machine table of today has kept pace with the improvement of the sewing machines used in the knitting business, and is a very important factor, because it is the foundation for every machine to run on.

MET

SILK DEPARTMENT.

The Use of Fine Silk Yarns.

The size of silk yarns which it is most advantageous to use depends largely upon the class of fabric being woven. The principal types (taffetas, satins, and twills) have their different characteristics, and must be treated accordingly.

The most general way of making taffetas is to employ a somewhat low set of warp, with a coarse size of raw silk, but a difference must be made between light and heavy qualities. For instance, if a fabric has a density of only 240 ends per inch, it must be sleyed 80's reed 3's instead of 60's reed 4's. The coarser 60's reed would show reediness, because the warp is not dense enough, and better cover is obtained by the finer reed. This 80-reed represents the limit up to which it is advisable to go with plain all-silk taffetas; and if, say 270 ends per inch were required in the warp, a 67's reed 4's would be used, not a 90's reed 3's. In weaving taffetas, only the best material should be used; a good Milan organzine, well twisted, is best adapted for the purpose. It is not advisable to use East Asian raw silks; Chinese is too uneven and rarely found in the proper sizes (20 to 24 den.); Canton is more even, but still much too rough. Under certain circumstances Japanese silk is even enough for use in making light qualities in low sets, but as a rule it is too flimsily thrown. A good cover and a smooth, soft, full touch are obtained from Japanese silk. For a fine quality, 24 to 28 den. is suitable if the reed does not exceed 72 dents per inch. It should be sleyed with an even number of threads in a dent for the better qualities, but this is sometimes impossible for coarser grades. In the case of very heavy goods it is sometimes advisable to draft the threads double, and a much better fabric is obtained with a 70's reed 4's double than with a 70's reed 8's single. This applies to both taffetas and grains.

For figured silks it is best to use coarse sizes of raw silk, thus dispensing with a fine warp, and necessarily a fine jacquard. This wise arrangement is usually made by French manufacturers, whilst in England and Germany finer yarns are used. Coarse sizes are also much easier to dye and weight, it being impracticable to weight threads under 20 den. higher than par, or 24 den. more than from 20 to 30 per cent. If this had been more considered a few years ago, says a contributor in the Textile Manufacturer, many dyers' debits might have been prevented, and German and Swiss taffetas would not have fallen into such disrepute.

The weft of these fabrics should be made of several-ply tram. A great difference is shown between a 30 den. tram woven 6 ply and a 45 den. woven 4 ply, although the two weights are the same. Sometimes price prevents the use of many ply weft, but at least 3 ply should be used. For instance, a 34/36 den. 3-ply tram woven 120 picks per inch will give a good, saleable taffeta. When a jacquard taffeta is well covered with the figure, Canton tram can be used, 48/52 den. 4 ply being suitable. By means of the four plies the material—which is naturally rough—loses a greater part of this disadvantage, and a very good cloth may be produced. Canton tram is easily adaptable for winding and spooling, this being especially true in regard to weighted yarns in the thicker counts. It is a cheap yarn, and its waste compares favorably with other kinds.

When weaving satins it is customary to use a fine set and a fine silk, this rule holding good for both yarn-dyed and piece-dyed fabrics. There is a limit to fineness when using yarn-dyed silks, this being about 100 dents per inch, and then only when the raw silk is well twisted and not too highly

weighted. Colored yarns should not be weighted above par, or black above 56 to 60 per cent. With organzine prepared on these lines it is safe to use as fine as 17 to 18 den., and even down to 16½ den., this latter being also suitable for half-silk goods. As a rule, there is no advantage gained by weighting the warp for half-silk colored fabrics on account of the high finish which these afterwards receive. This treatment neutralizes the effect of the weighting. Half-silk black fabrics, on the other hand, usually have the warp weighted.

All-silk satins are seldom subjected to a finishing process, and a weighted warp supplies them with a better handle. In such goods it is also permissible to use thicker raw silk and a coarser reed, for there is not much trouble caused by reediness. For instance, taking a yarn-dyed satin with 228 ends per inch, woven with a 22 den. organzine warp, a 57's reed 4's must be used, because 114's reed 2's would be unweavable, and 76's reed 3's is undesirable, owing to the effect always produced on an eight-satin weave by reeding in 3's, which makes the fabric unsaleable. If, however, 16½ den. is used in 76's reed 4's a better result is obtained, although one-third more warp threads are necessary for the same weight of material.

Piece-dyed satins come under the same rules as the yarn-dyed class, but they are easier to weave. They can also be used in finer sets, 160 dents per inch being possible, and an eight-shaft satin can now be woven 160's reed 2's, where formerly 80's reed 4's was employed. With this reed it is possible to use down to 12 den. raw silk, whilst with a 120 reed, 10 den. is the limit. These sizes make a cheap cloth, owing to the small weight of material necessary. It is scarcely possible to discern between a 10 and a 12 den. satin, especially in figured silks, whilst the former means a saving of 20 per cent. of raw material.

There is little difference between the manufacture of twills and satins, and what has been said about one will apply to the other with very few exceptions. It may, however, be well to remark that double-warped twills require a much less expensive quality of raw material.

French Methods in the Silk Industry.

A view of the methods of carrying on the silk industry in Lyons, France, brings forcibly to mind the wide difference between French and American systems.

The Lyons manufacturer, as he is called, has an office and a salesroom, where he buys the raw material, and where the people, whose services he requires, meet and bargain with him. His purchases are limited to his actual requirements, as regards both quantity and quality. He sends the silk to the shops, where the various processes are carried on. It is first sent to the dyer, and then to the winder, who places it on bobbins. Then comes the warper, who prepares the material for the loom, and the warp is then given to the "canut" who does the weaving.

The proprietors of the weaving plants manufacture to order only. They invest nothing in stock in process, and are paid only for the work done in turning the material from one form to another in the necessary process of manufacture. The manufacturer owns the material, but is not burdened with the care of buildings and machinery, or the management of help, and has no responsibility for the manufacturing processes. The reelers, throwsters, weavers and dyers on the other hand do not bear any of the risk of the business. Their part is finished when they have done the work as ordered.

Under this system, if business becomes dull, and stoppages result, the workers lose their time, and must bear the expense of caring for their mills and machinery. But they are not affected directly by the rise and fall of prices, as they own no material.

This loss is borne by the manufacturer, on such stock as he may own,

but this is small because he has purchased only for actual requirements, consequently he sits in his office in dull times with no stock on hand, paying no bills, and while making no profits, he is incurring no losses.

This system possesses many points of advantage over the American methods, and is not attended with the great risk of loss which is taken when immense stocks of material and goods and extensive mills are owned by one company. The French system is the result of a process of evolution, covering hundreds of years, and starting with the worker in the homes and on the farms of France.

American Silks at the Paris Exposition.

The address of Franklin Allen to the Silk Jury of the Exposition gives a very clear idea of the scope of our exhibit of silks, and the grounds on which we may expect awards to be made to the American exhibitors. Mr. Allen spoke as follows:

The exhibition of silks made by American manufacturers at this Universal Congress includes samples of sewing silk, embroidery silk, machine twist, ribbons, lining silks, silks for ties and scarves and silk tissues.

It is specially necessary to bear in mind that these goods represent the ordinary stock of the manufacturers; that they have been selected from their current production and are in no sense the result of a selection made on purpose for the occasion. One cannot for one moment expect that these goods will bear comparison with the beautiful foreign goods, prepared with so much art and especially for this exhibition, but the American exhibit will at least demonstrate the capacity of the American manufacturer to meet the demands of the prevailing market in his country. The merits of the American manufacturer is his power of manufacturing promptly and well whatever the people want without in any way overstocking his shelves with out-of-date goods.

High grade novelties are not for the time being fashionable in America, and our exhibition may perhaps be considered deficient in the respect. The goods which we expose are sold at moderate prices, made for the great mass of our general public, and are goods which our manufacturers are well able to make. Nevertheless, although our exhibition is far from being complete, a very exact idea is given of the goods in current demand in our country. We dare to hope, therefore, that our exhibit will merit examination and consideration, and that you will find in our products and amongst the names of the manufacturers sending the goods, sufficient to recommend them to your attention.

In the American section, Class 83, you can see also looms in operation, which I think will interest you, and deserve inspection; the two American looms representing our industry are perhaps more advanced than the French, Swiss or German looms, in the simplicity of their mechanism, in the rapidity of their movement and consequently in the increase of the daily wage of the weaver.

Allow me in concluding to express to my colleagues of the International Jury, the hope that the motto of the Silk Association of America "A fila corona" (from a thread glory), may crown in your awards some of the goods manufactured by the Silk Manufacturer of the United States.

—Fulling.—Soap has a double function in the fulling process. It ought to detach dirt and oil, and keep the scales of the hair open. The felting is increased by this means; and further, the fibre is protected against friction and heat, which would render it brittle and rough. In the former case the alkali exerts its cleansing property and action; in the latter, the fat preserves the softness and the elasticity of the material.

Silk Industry of Hangchow.

Over one-third of the total value of merchandise exported from China is represented by silk and its products. In some sections, such as Hangchow, the exports of silk exceed in value all other exports combined and this trade has been steadily increasing.

The British consul at that place states that, although the Shih Ching steam silk filature established shortly before the opening of the port near the foreign settlement has not proved a success, on account of the want of good cocoons and the high price of skilled female labor, other silk filatures have been in successful operation at T'anghsi and Hsiao Shan.

The number of mulberry trees grown in the Hangchow district is enormous, and gives the idea that silkworm-rearing is more extensively carried on than in Kiangsu. The quality of the cocoons is pretty good, but could be improved by the adoption of western methods, through the selection of eggs and scientific rearing of the worms. The color of the cocoons is a pale green, which is a drawback, as buyers of silk are very much attracted by the nice white color of Kiangsu and Shaohsing silk. Still the brilliancy of Hangchow silk, as reeled in Shanghai, is sometimes superior to that of Shaohsing. The nature of the thread is equally good, and could be improved with care and European supervision. In size the cocoons are as large as Shaohsing, and larger than at Wuhsi, but owing to lesser thickness the yield of silk is less.

At Yuhang the size and shape of the cocoons approximate to the Shaohsing standard; that is, they are thicker than at Hangchow, and the yield is therefore superior. Hangchow purchases show rather a mixture of sizes and shapes—about 20 per cent. being of smaller size and finer grain, indicating that farmers are trying to introduce other races from other districts with the intent of ameliorating the quality of the crop.

Now and-then baskets of very big, downy, soft cocoons come in, which are unsalable. The cocoons brought to the Hangchow settlement are mostly reared within a radius of 10 miles or so, only a few coming from 20 miles away. Last year's crop, as in other districts, was good both in quality and quantity. The disease "calcino," which is alarmingly prevalent in some parts of Kiangsu, is but rarely noticed in Hangchow cocoons.

It would be an interesting speculation to inquire how far the favorable position of silk-worm rearing in the district is due to the efforts of a school of sericulture founded by the provincial authorities of Chekiang some three years ago. This institution occupied a range of buildings near the western shore of the famous West Lake, within a few miles of this city. It is under the presidency of the Hangchow Prefect.

The term for which it was established expires this autumn, and it is a question whether it will be continued.

Mr. Clennel is indebted to his Japanese colleague, Mr. T. Wakamatsu, some of whose fellow-countrymen are interested in this enterprise, for the information that a Japanese teacher was invited to take charge of the classes in May, 1898; and early in 1899 he was joined by another. There are about 43 students, 18 in the senior and 25 in the junior class.

There is to be a graduation in July this year.

Since the beginning of this year there has again been only one Japanese teacher on the staff, and this, with a deficiency of funds, makes the position of the school unsatisfactory; but its work for the last two years has given it a good reputation, and some of the students come from quite distant places. The cocoons grown on the spot are said to be very good and the silkworm eggs are widely distributed.

POWER DEPARTMENT.

ELECTRICITY—STEAM—WATER.

The Value of a Horse Power.

Abstract from the paper read at the Annual Meeting of the New England Manufacturers' Association by Samuel Webber, Charlestown, N. H.

My attention has been recently called to the question noted above, by a paper read by Geo. L. Rockwood of Worcester, before the American Society of Mechanical Engineers, and it leads me to bring the question before the Association in these forms, dividing it as follows: Do you know how much your power costs you per annum, either steam or water? What per cent. of the cost of labor and other expenses do you pay for power; and if you should move an inland mill to the seaboard, to save cost of freight and coal, might that saving not be overbalanced by the extra cost of labor, and other expenses not covered or affected by freight charges?

Mr. Rockwood's paper is a short analysis of the evidence given by a number of well known engineers, in the various cases of suits brought by the mill owners on Blackstone River, against the city of Worcester, for the abstraction of the water of Kettle Brook for municipal purposes, and the average value of a horse power was summed up by Mr. Kent, one of the engineers, as being $50 per annum, or the cost of replacing it by steam.

This agrees exactly with the conclusion which I came to myself, long since, as the fair cost of small steam powers in New England, but it is confronted by a different set of statements, made by other engineers, as to the cost of steam power in large quantities, where these engineers have been employed by mills who sought an abatement of taxes, and a depreciation of the value of their water power plant, and in these cases the engineers have assumed that power in large masses of 1000 horse power or more, could be furnished on the seaboard, by engines and boilers of modern construction, for a maximum of $20 per horse power, and from that to much lower cost.

With the latter I do not agree, and unless the manufacturing establishments are of such a character as to require a large amount of low pressure steam for dyeing, bleaching and similar purposes I am inclined to think that the minimum cost of steam power should be taken at about $20 except in cases of very large powers, for it is a well established fact, that the cost of a steam plant diminishes per horse power in the inverse ratio of its increase in size, and the cost of operation diminishes in the same direction. It does not cost four times as much for an engineer to run a 1000 horse power engine as it does for one to run 250. The cost of firemen and laborers seems to diminish also per horse power, and the cost of fuel also appears to be less as a general rule.

I had occasion a few years since, when employed in one of these appraisement cases, to endeavor to get the actual cost of a horse power of steam, from a favorably situated mill, which was using steam for power only, and without reference to the use of exhaust for heating or any other purpose. These facts I obtained from Arnold S. Sanford of Fall River, for an engine of 1050 horse power during the months of April, May and June, 1893, when the engine, a compound condensing one, was so run. The cost of the plant, engine, boilers, etc. was given me as $66,000, or $62.83 per horse power.

Coal burned in 73½ days, 1,527,000 pounds at $3.70 per gross ton, or $2519.55. Labor, $555.50, oil and sup-

plies, $76.50, being a total expenditure of $3157.55 for the 73½ days, equal to $13.25 per horse power per annum for coal, labor and supplies. To this I add charges on cost of plant as follows, giving in parallel columns, results since attained by F. W. Dean and the late Dr. Charles E. Emery.

It is also stated in the same number of the magazine, that while as low as $20 per horse power had been reported in England, yet that $45 per horse power would probably represent the average cost more closely.

	Webber. "Gross." 1050 H. P.	Dean. "Gross." 1132 H. P.	Emery. "Net." 1000 H. P.
Coal, per Horse Power, per annum	$10.60	$13.90	$11.80
Labor, per Horse Power, per annum	2.33		2 57
Oil and Supplies, per annum	.32		.80
Sinking Fund for depreciation, 5 per cent.	3.14	6.77	7.94
Repairs, 2½ per cent.	1.57		
Interest and Taxes, 6 per cent.	3.77		
	$21.73	$20.67	
Add for loss in engine, 10 per cent.	2.17	2.07	
Net Horse Power	$23.90	$22.74	$23.11

I have probably allowed one half of one per cent. more for repairs than either of the other gentlemen, making my total a little higher, but the general agreement is sufficiently close. To these I might add the following list of actual costs as collected by R. S. Hale for Edward Atkinson, the different mills being designated only by letters.

My son, William O. Webber, has prepared a "graphic diagram," showing the variation in the cost of steam power, due to difference in size of plant, deduced from the results obtained, and the estimates made, by Messrs. Chas. E. Emery, F. S. Dean, R. S. Hale, Chas. T. Main, and myself, at different times and places, covering a long series of observation, and

	Horse Power.	Coal.	Labor.	Expended, including interest and depreciation.	Total.
Mill designated A	1250	$12.00	$1.52	$4.04	$17.62
" " B	600	19.50	3.01	6.10	28.61
" " C	917	12.61	3.67	9.59	25.77
" " D	1239	12.59	2.10	4.16	18.85
" " E	770	15 49	2.74	4.50	22.63
" " F	1300	11.07	2.27	4.55	17.89
" " G	1431	17.11	3.11	4.77	24.99
" " H	1055	15.82	3.25	7.31	25.38
" " I	865	14.14	3.06	4.04	21.24
" " J	920	15.75	2.32	8.97	26.04

Interest and depreciation included at ten per cent. on machinery and six per cent. on buildings.

The great discrepancy in these returns will be noticed at once, mill A giving a very low cost of labor, B and G a very high cost for coal and C, H and J very high general expenses, and if as is probable, the power was taken from indicator cards, ten per cent. should be added to get the cost as delivered to the machinery, as it is from a water wheel, which is estimated from its results, and not from the water applied to it.

as nearly as I can reduce this curve to round numbers, it gives the cost as follows:

For 100 H. P.,	$63.00	For 800 H. P.,	$26.00
" 200 "	45.00	" 900 "	25.00
" 300 "	37.00	" 1000 "	24.00
" 400 "	32.00	" 1500 "	22.00
" 500 "	29.00	" 2000 "	21.00
" 600 "	28.00	" 2500 "	20.00
" 700 "	27.00		

These figures are supposed to represent net horse power delivered from the engine.

As above noted, these costs would be very much reduced in cases like

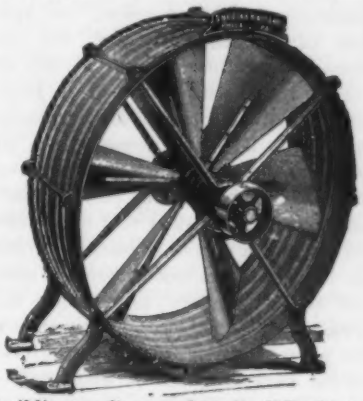
those of the Amoskeag, Manchester, and Pacific Mills, where a large boiler plant is always required to furnish low pressure steam for dyeing and bleaching purposes, and where the cost of power would be reduced to charges on engine and additional boilers, wages of engineer and extra firemen, and coal consumed in raising pressure from 30 to 120 pounds, and the steam used for dressing yarn or heating mills, say from $3.00 to $5.00 per horse power, should be deducted or added to the cost of water power in making comparisons.

I have previously submitted to the Association a paper on Water Power and Its Developments, in which I gave the cost of some modern water power plants, as compared with the great expense entailed at Lowell, by the enlargements necessitated by insufficient original plans of water ways, and the desire to obtain the benefit of the large amount of surplus water, which for a portion of the year ran by unused, the result being that turbines equal to 18,000 horse power had replaced the old breast wheels of 10,000, and I now submit this paper showing the actual results of examinations into the cost of steam power, that they may be compared with the previous statements based on picked firemen, selected coal and clean boilers, which have been employed to deteriorate the value of water privileges, and to use as a basis for the claim that steam is cheaper than water.

All knowledge is valuable at some time, or to somebody, and any facts which members of this Association can contribute to the general stock from their own experience will doubtless be of future value, though it seems to me, after long examination, that no such thing as a general standard, for the "Value of a Horse Power," can be determined, and that it is a matter which is controlled by situation, circumstances and demand.

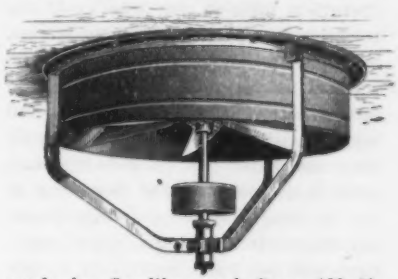
Snediker & Carr's Fans.

Manufacturers generally are coming to the belief that the ventilation of their workrooms is essential, not only to the health of their employees, but also to highest efficiency of their work. The peculiar construction of mill



buildings often makes it difficult to locate ventilating apparatus where it will do the most good, and under the most approved construction the removal of steam from dye houses is a difficult problem.

The exhaust and ventilating fans



made by Snediker and Carr, 139 N. Seventh Street, Philadelphia, Pa., are designed to do this work with the least power and noise possible. Two of the many types of fans, made by them, are shown in the accompanying illustrations. They also manufacture many forms of hangers and idlers, for carrying the power to the fan, when located in the ceiling or at various angles to the mill shafting.

In addition to their fans for mill work, they manufacture many types of ventilating machinery for offices, stores, dwellings, etc.

The Future Development of the Steam Engine: A Forecast.

Paper read before the Manchester, England, Association of Engineers, by Alfred Saxon.

(Continued from July.)

With the adoption of the higher pressures mentioned above, the system of expansion working will be more utilized, but must be subject to certain limits with regard to the number of cylinders employed. Probably it will not be found necessary to go beyond quadruple expansion even with the high pressures now suggested. When we consider that in locomotive work, in simple engines pressures up to 200 pounds can be used, it does not seem necessary to multiply the number of cylinders, but to regulate the point of cut-off and the proportions of the various cylinders employed to each other, to utilize the expansion of the steam to the fullest practical extent.

With reference to engine speeds, the double-acting vertical type, with forced lubrication, has opened up great possibilities in this direction; there is a limit to the velocity of the reciprocating parts of such an engine, but this does not seem to have been reached as yet. With stronger and lighter materials available, which will be produced as the necessity arises for their use, and still greater attention paid to the more perfect balancing of the rotating and reciprocating parts, higher speeds will be attainable, and I have not the least doubt that in stationary land practice we shall be able to approach the high speed of 1500 feet per minute.

Dealing with economy, reliable tests of the best steam engines of today show a steam consumption varying from 12 to 10 pounds of steam per indicated horse-power per hour, or say, 1½ to 1¼ pounds of coal.

The gain in economy in the new century must be very gradual and comparatively small; no doubt, if the gain were taken upon a percentage basis, we might reasonably predict a saving approaching to 50 per cent. on the present steam and coal consumption. The probabilities of the new century in this respect seem to be to reduce the steam consumption to about 8 pounds, and the coal per indicated horse-power per hour down to one pound, or even to ¾ pound of the best fuel burned under the most efficient conditions, in the newest and best types of boiler plant.

From experience already gained, it would seem that for lighting and electrical traction, the use of very large units of power will be most economical, not simply in economy in coal consumption, but in a great many ways in connection with the standing and running charges of these large central stations. I shall not attempt to describe the Glasgow Corporation engines, the order for one-half of which has gone to America, and the other half to a Lancashire firm, but this instance will serve to show the magnitude of the present-day schemes, and in all probability the units of power adopted in the scheme referred to above, viz., 5000 I. H. P., will be well up to the producing capacity of the machine tools in our stationary engineering works at the present time, and I have no doubt that units of 10,000 I. H. P. will be the limit for many years.

I have just referred to what public enterprise is doing in relation to electric power, but how will the general industries of the country be influenced by the progress of electricity? To judge by the signs of the times in America, and in this country more recently, there will continue to be a growth of combination and the formation of trusts in industrial circles, which will have the effect of introducing large schemes for lighting and power.

The direct-acting inverted vertical engine with the cylinders arranged for expansive working, has proved its adaptability to meet existing conditions in central-power stations, and with still higher steam pressures and increased piston speed, together with

the application of forced lubrication, is, in my opinion, the engine that will meet the new century's demand in this respect.

I predict that engine makers in the new century will make a great point of standardizing and classifying their engine designs, and that suitable units of power will be adopted to meet the varied demands.

I am also of opinion that the use of small steam engines and engines of moderate sizes working at low pressures will be discarded, or the latter altered before the first quarter of the new century has expired. Only compound, triple and quadruple expansion engines of the best type will be used, and these in most cases for the generation of electricity, for its application to the driving and lighting of our industrial works and factories.

The various types of engines referred to above will, in my opinion, be arranged to work at the highest possible pressures with superheated steam. There is no doubt that for general practice, with a view to utilizing the present type of Lancashire boiler—which is not suitable for pressures greatly exceeding 200 pounds—that in the immediate future superheating will be more generally adopted; it has been extensively adopted in Continental practice, but up to the present time only to a limited extent in English practice.

I forecast the general adoption of superheating and re-heating in land practice before there is a resort to much higher pressures than are now in use; after the fullest benefits have been secured from this source there will come the demand for higher pressure.

The steam turbine engine is likely to be a formidable competitor in electrical work, but on account of its high speed will not prove so universal in its application as the reciprocating steam engine. Simplicity in the valves and valve gear seems to be the lesson which the steam turbine engine teaches the reciprocating-engine builder, and in this respect a diminution of cost and wear and tear will probably be arrived at without interfering with the economy of the steam engine. Although the governing cylinder will still of necessity retain valves and valve gear for the measurement and control of the steam to be admitted for work to be done during each stroke, still I venture to forecast the abolition of the valves and valve gear of the succeeding cylinder or cylinders.

If it is possible to use steam economically through a steam turbine engine, and to utilize the system on the compound principle to gain the advantages of the expansive properties of steam without the aid of the elaborate and oft-times cumbersome valve gear now in use, surely it is possible to advance in the same direction in the ordinary reciprocating steam engine. In fact, as our piston speeds increase a simpler system will become more and more imperative.

In London, we have electric traction at work on various lines; in Liverpool, the overhead electric railway; Blackpool to Fleetwood electric tramway; we have the scheme of the Manchester and Liverpool electric railway proposed, and other schemes in actual operation in various parts of the United Kingdom. In the U. S. A. immense power stations are being constructed to deal with local railway and tramway traffic.

And now, gentlemen, I would say that our position in the industrial world during the greater portion of the nineteenth century has been created and maintained by the superiority of our coal and iron supplies.

Great as have been the achievements of the nineteenth century in the perfecting of the steam engine, and although we have approached considerably nearer the goal of theoretical efficiency than many of the old engineers would have thought to be possible, still there lies before us a great victory over waste.

Burt Exhaust Head.

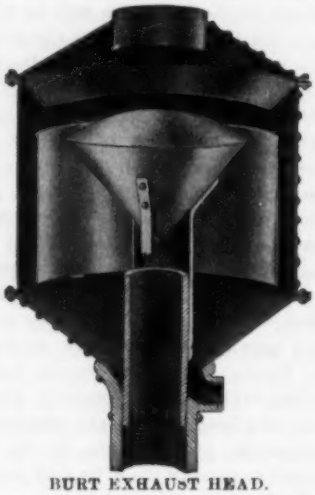
In the construction and equipment of modern power plants more attention is devoted to the refinements of practice each year, and there is a constantly increasing demand for devices that partake of the nature of aesthetic improvements. Occasionally there is an invention or improvement of this kind that has a practical value as well. Such is the character of the apparatus illustrated herewith.

The Burt exhaust head is attached to the exhaust pipe of the boiler system and prevents oil and wet steam from getting out, drenching, disfigurement and rotting the roof and building, and injury to adjoining property. It prevents dripping to the street and sidewalk below; the formation of ice on the walks in winter, and accidents to limb, clothing and vehicles. It keeps back not only the moisture, but the oil particles in the exhaust, and since water of condensation which has its oil removed is almost chemically pure, it saves water belonging to the steam system. This water of condensation may be returned advantageously to the boilers for re-evaporation, since there are no oil particles in it to coat the shell and destroy the heating effect. In cases where the feedwater contains mineral solutions or sediment there is decided saving in using the same water over and over again.

The cut gives an excellent idea of the design of the Burt exhaust head, showing a sectional view through the central axis. It will be noticed that the outer casing of the device, instead of being conical is cylindrical, with perpendicular sides, and thus contains a greater number of cubic inches than a conical head of the same diameter. And the greater the volume, the greater the expansion of the exhaust steam and the greater the amount of surface for condensation. Besides, where there is ample space for the exhaust, there is little liability of back pressure.

It is claimed that the volume of the steam chamber is not lessened by the use of baffle-plates, diaphragms, or the like, and that the whole head is an exhaust chamber, and the absence of baffle plates means less friction and hence less back pressure. This head is made from extra heavy iron, lapped, riveted and soldered and is very strong and durable. All joints, seams and attachments are water tight. It will not break, and it will not rust, being protected with a heavy coating of anti-rust paint.

The exhaust steam, after coming in through the pipe, strikes the cone immediately over the inlet. This cone separates the steam into the finest particles, condensing some of the vapor. The steam then rises to the narrow annular projection extending about the top of the head. This, on account of its downward slope holds the steam there for an instant, during which time the oil and water particles collect upon it and fall down between the two casings, and are drained out at the drip below.



BURT EXHAUST HEAD.

The manufacturers claim that on account of the large amount of condensing surface in this head it will condense more steam than any other design, while nothing but dry steam will escape. The device is manufactured by the Burt Manufacturing Company, of Akron, Ohio, who are widely known as the producers of the Cross oil filters.

DYEING DEPARTMENT

Dye Recipes for August.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

Recipe No. 113.

Brown on Worsted Yarn.

Anthracene Acid Brown W on 100 lbs. of worsted yarn.

Prepare dye bath with

4 lbs. Anthracene Acid Brown W.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

10 lbs. Glauber's Salt.

3 lbs. Acetic Acid.

and towards the finish add

1 lb. of Sulphuric Acid.

Enter at 160° to 170° F., bring to a boil and dye at this temperature for one hour.

Anthracene Acid Brown W dyes very level, penetrates well, and is extremely fast to light, alkalies, acids, milling and steaming.

Recipe No. 114.

Pink on Worsted Yarn.

Acid Rhodamine R on 100 lbs. of worsted yarn.

Prepare the dye bath with

1% Acid Rhodamine R.
(A. Klipstein & Co., 122 Pearl St., New York.)

5% Glauber's Salt.

2% Sulphuric Acid.

Enter yarn at 140° F., turn while bringing to a boil, and dye at this temperature for 20 to 30 minutes.

Acid Rhodamine R is a new coloring matter, most suitable for the dyeing of wool and silk, either hanks or piece goods. It dissolves very easily, and is remarkable for the pure and full shade it produces. It is very fast to alkalies, acids, washing and sulphuring, and its fastness to light is much better than that of the eosines, erychrosines and phloxines.

Recipe No. 115.

Blue on Cotton Yarn.

Alizarine Blue D G on 100 lbs. cotton yarn.

Prepare the dye bath with

1 lb. Alizarine Blue D G.
(Victor Koechl & Co., 122 Hudson St., New York.)

10 lbs. Common Salt.

Enter the yarn at 180° F., bring to a boil, and dye at this temperature for one hour and then work in the bath for 20 minutes as it cools.

Alizarine Blue D G has a high coloring power, goes on the fibre evenly, and possesses all the characteristic properties of the direct cotton colors.

Recipe No. 116.

Red on Cotton Yarn.

Direct Red 4B on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Direct Red 4B.
(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

20 lbs. Common Salt.

½ lb. Soda Crystals.

Enter the yarn at or near the boil and dye at a full boil for one hour.

Direct Red 4B is a direct cotton color of very good qualities.

Recipe No. 117.

Violet on Worsted Yarn.

Violet S O O on 100 lbs. of worsted yarn.

Prepare dye bath with

1 lb. Violet S O O.
(C. Bischoff & Co., 87-89 Park Place, New York.)

2 lbs. Sulphuric Acid.

5 lbs. Glauber's Salt.

Enter the yarn at 160° F., bring slowly to a boil, and dye at this temperature, exhausting the bath. To in-

sure evenness, it is well to add the acid in portions, rather than at one time.

Violet S O O has a very high coloring power, goes on the fibre evenly, and may be combined with any other color of a similar nature.

Recipe No. 118.

Brown on Cotton Yarn

Alizarine Brown D R on cotton yarn.

Prepare the dye bath with

3 lbs. Alizarine Brown D R.
(Victor Koechl & Co., 122 Hudson St., New York.)

25 lbs. Common Salt.

1 lb. Soda Ash.

Enter yarn at 180° F., bring to a boil, and dye at this temperature for one hour.

Alizarine Brown D R produces a rich shade of brown and possesses all the characteristic properties of direct cotton colors.

Recipe No. 119.

Red on Cotton Yarn.

Direct Safranine B on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Direct Safranine B.
(John J. Keller & Co., 104-106 Murray St., New York.)

20 lbs. Common Salt.

Enter yarn at 180°, and dye at a boil for one hour.

Direct Safranine B produces a brilliant and even shade of bluish red.

Recipe No. 120.

Blue on Worsted Yarn.

Formyl Blue B on 100 lbs. worsted yarn.

Prepare the dye bath with

3 lbs. Formyl Blue B.
(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

10 lbs. Acetic Acid.

Enter at 150° F., bring to a boil and dye at this temperature for one hour. If the bath does not exhaust add one-half pound sulphuric acid.

Formyl Blue B is distinguished by very good leveling properties and excellent fastness to washing and milling. Another very important field for the employment of Formyl Blue B is the dyeing of union goods in a neutral bath.

Recipe No. 121.

Yellow on Cotton Yarn.

Diphenyl Fast Yellow G G on 100 lbs. cotton yarn.

Prepare the dye bath with

1 lb. Diphenyl Fast Yellow G G.
(John J. Keller & Co., 104-106 Murray St., New York.)

20 lbs. Common Salt.

Enter the yarn at 180°, bring to the boil with constant working and dye at this temperature for one hour.

Diphenyl Fast Yellow G G penetrates well, goes on the fibre evenly, and its fastness is very good.

Recipe No. 122.

Crimson on Cotton Yarn.

Brilliant Purpurin 10 B on 100 lbs. of cotton yarn.

Prepare the dye bath with

3 lbs. Brilliant Purpurin 10 B.
(Berlin Aniline Works, 72 Front St., New York.)

20 lbs. Common Salt.

Enter material at 180° F., bring to a boil and dye at this temperature for one hour.

Brilliant Purpurin 10 B dyes evenly and possesses all the characteristic properties of the direct cotton colors. It is also valuable for its brilliancy of shade.

Recipe No. 123.

Black on Cotton Yarn.

St Denis Black B on 100 lbs. cotton yarn.

Prepare dye bath as follows:

To kettle containing 300 gals. water add

For Starting Bath

30-35 lbs. St. Denis Black B.
(Sykes & Street, 85 Water St., New York.)

300 lbs. Common Salt.

For Second Bath

20-25 lbs. St. Denis Black.

100 lbs. Common Salt.

Third and following bath

15-18 lbs. St. Denis Black.

50 lbs. Common Salt.

Enter the previously wet out yarn, and dye at a boil for one hour. Lift, allow to drain, wash well, and fix in a bath made up as follows:

6-10 lbs. of Copper Sulphate.
10 lbs. of Common Salt.

Enter the yarn into this bath at 110° to 120° F., and work for one-half hour, raising the temperature meanwhile to 160° F. to 175° F., according to shade desired. (The higher the temperature the redder the shade.)

Soaping produces brighter and slightly bluer shades.

The dye kettles must be of wood or iron.

St. Denis Black B belongs to the sulphur group of coloring matters, of which the Cachou de Laval and Thiocatechines form a part, and is a distinct improvement upon the former standard Vidal Blacks. It dissolves readily without the use of sodium sulphides, goes on the fibre evenly, and is remarkably fast to light and washing.

Recipe No. 124.

Brown on Cotton Yarn.

Rhine Brown B E on 100 lbs. of cotton yarn.

Prepare the dye bath with

3 lbs. Rhine Brown B E.
(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)
20 lbs. Common Salt.

Enter the cotton at about 180° F., raise to the boil and continue the boiling one hour, then wash and dry.

Rhine Brown B E dyes cotton a full and rich shade of brown, and one which possesses great fastness to light and washing.

The shade produced can be made still faster to light and washing by subjecting to an after treatment of 2% Bluestone and 1% Chrome at 160° F., for one-half hour, then washing and drying.

Recipe No. 125.

Red on Worsted Yarn.

Azo Red B on 100 lbs. of worsted yarn.

Prepare the dye bath with

3 lbs. Azo Red B.
(C. Bischoff & Co., 87-89 Park Place, New York.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter yarn at 170° F., bring slowly to a boil and dye at this temperature for one hour, exhausting the bath, if possible. It is well to add the acid in portions, rather than all at one time.

Azo Red B produces a brilliant shade of bluish red, and its fastness to light is remarkably good, and its fastness to washing, alkali, acid, sulphur, ironing and steaming, is also very good.

Recipe No. 126.

Blue on Worsted Yarn.

Acid Blue 2 B O on 100 lbs. worsted yarn.

Prepare the dye bath with

3 lbs. Acid Blue 2 B O.
(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter the wool at 170° F., bring slowly to a boil, and dye at this temperature until the bath is exhausted. It is well to add the sulphuric acid in separate portions rather than all at one time.

Acid Blue 2 B O produces a brilliant shade of peacock blue, possessing excellent properties.

Recipe No. 127.

Yellow on Cotton Yarn.

Direct Fast Yellow 6 G on 100 lbs. of cotton yarn.

Prepare dye bath as follows:

1 lb. Direct Fast Yellow 6 G.
(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)
35 lbs. of Common Salt.

Enter the cotton at the boil, and continue the boiling for one hour. The bath is not exhausted.

Direct Fast Yellow 6 G when dyed with this percentage, produces an extremely rich and full shade of lemon yellow, and one which possesses great fastness to light, washing, soap and

chlorine, and is well adapted for all classes of fine work. The addition of a little sal soda to the bath tends to redden the shade.

Recipe No. 128.

Reddish Violet on Worsted Yarn.

Fast Sulphon Violet 4 R on 100 lbs. of worsted yarn.

Prepare the dye bath with

2 lbs. Fast Sulphon Violet 4 R.
(F. E. Atteaux & Co., 176 Purchase St., Boston.)

2 lbs. Sulphuric Acid.

Enter yarn at 170° F., bring slowly to a boil and dye at this temperature for one hour, exhausting the dye bath. For light shades it will take less time to exhaust.

To assure evenness it is well to add the dyestuff in separate portions, rather than at one time.

Fast Sulphon Violet 4 R is characterized by its fastness to alkalies, acids and washing. Its fastness to light and rubbing is exceedingly good and owing to its facility of dyeing level, is particularly suitable for piece dyeing.

Dyehouse for Ten Set Woolen Mill.

A ten set woolen mill usually requires, in connection with a dyehouse, facilities for scouring wool, carbonizing, coloring and drying raw stock and pieces, and in some cases for coloring and drying yarn.

In order that competent workmen with the proper material may be able to do good work in this department at a low cost, it is essential that the right machinery and apparatus be provided, and properly arranged in convenient buildings.

The increased cost due to inconvenient arrangement of dyehouses affects the majority of our mills. The material handled is naturally heavy and bulky, but the weight is greatly increased, because for the most of the time it is in a wet state.

The dyers' office should be located first, and provided with plenty of room and light; the windows opening to the north, so that a clear light will be available for matching shades. This office should be convenient to the drug room and dyehouse. In most mills this feature is neglected, and we find the dyer located in any little hole that can be spared for the purpose, generally small and dark, or with the sun pouring in for the greater part of the day. A well arranged dyer's office will pay large dividends to the mill providing it.

The wool scouring and carbonizing should be in a room adjoining the dyehouse, and under the sorting room, so that the wool can be dropped from bins on second floor to the scouring machine below. Let the extractor be located so as to be convenient to the delivery end of wool washer, for the wool, which is to be dried white, and also near the dyetubs to receive the colored stock. The feed end of the dryer should be near this extractor. A separate extractor must be provided for the carbonized stock, near the soaking tank and dryer, but separated as much as possible from the rest of the dyehouse owing to danger of injury to yarn, pieces or colored stock from the acid used in carbonizing.

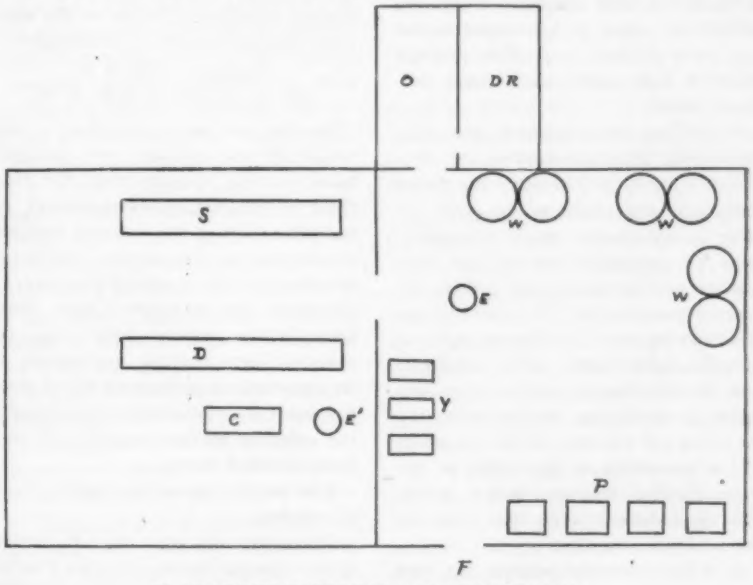
The dyetubs for raw stock should be located near the outside wall in order to save floor space, and in such relative position as to enable the stock to be easily thrown from one tub to the next one; they should also be convenient to the scouring machine.

The piece dye tubs should be in that part of the dyehouse most convenient to the finishing room, and so located that the raw stock in process will not be in the way of the trucks, passing between finishing room and piece-dye tubs. The yarn dye tubs can be placed in any convenient position where they would not interfere with other operations.

In the accompanying sketch we have endeavored to show plan of a dyehouse, answering to the above requirements. The scouring machine is at S; soaking tank and extractor for carbonizing, C and E'; dryer, D; of-

fice, O; drug room, DR; wool tubs, W; extractor, E; piece dye tubs, P; yarn tubs, Y, and finishing room, F.

There is no class of people who realize the economy and great advantage of well appointed dyehouses so thoroughly as do the dyers, and we would like to hear from them or any of our readers as to the arrangement of dyehouses for various classes of goods. We have in this article confined ourselves to the consideration of a dyehouse for the average woolen mill, but the arrangement must be different for other classes of goods, and views from practical men on dyehouses for knit goods, worsted yarn and tops of cotton goods, etc., would be of interest.



PLAN OF DYE HOUSE FOR 10 SET WOOLEN MILL.

Novel Arrangement of Color Cards.

A novel and useful arrangement of color samples has been made by Victor Koechl & Co. in their sample card, series M, No. 1, just issued.

Side by side with a sample of the combination shade are placed samples colored with each of the dyes, required to make the compound shade; for instance, a sample of cloth, colored drab, is shown, which requires 7 ozs. Pat. Blue, 5 ozs. Azo Acid Magenta G. and 3¼ ozs. Azo Yellow, per 100 lbs. of cloth. Alongside of the drab sample are placed three samples showing the shade produced by each one of the three dyes in proportions required for the drab.

This arrangement enables the dyer to see at a glance the effect produced by any one dye. It will enable him to work more intelligently than heretofore, in bringing colors to shade required.

We understand that Messrs. Koechl & Co. have applied for a patent on this arrangement of samples. Forty compound shades are shown in the card received; some of them required four different colors, each one of which is shown. This arrangement will be found very useful by dyers, designers and manufacturers generally.

—To remove oil spots, benzine is the best material, and should be applied, if possible, with a rag of the same color as the stuff to be cleaned, and never with a dark dyed rag.

Note on the Sulphur Blacks.

In my previous communication I showed that cotton dyed with sulphur colors was easily injured in consequence of the action of sulphuric acid, which tenders the fibres.

I also pointed out that the sulphuric acid may get into the material in various ways—

(1) By the use of sulphuric acid as such during the fixation of the color.

(2) By the presence in the material of finely divided sulphur, which by subsequent more or less rapid oxidation tends to form, in passing through more or less numerous stages, sulphuric acid.

I shall not refer again to the presence of the sulphuric acid on the fibre due to what is left in after the fixing operation, especially as, in case the fixing should be necessary, the employment of sulphuric acid for the purpose is not necessary, as I have already demonstrated. If, however, the dyer has employed sulphuric acid, or metallic salts along with sulphuric acid, for the fixation of the color, any excess is easily got rid of after the operation by washing or neutralizing.

It is especially to the origin of the finely divided sulphur, which generates the sulphuric acid, that I should like to draw attention.

As I have already pointed out, and as Dr. Ree likewise says, in the discussion on my first note, the free sulphur may be derived from various sources, and as this is a most important point, it is necessary to enumerate them and see what practical conclusions may be drawn.

In the application of the sulphur blacks there are two totally different causes which can account for the presence of free sulphur on the dyed fibres. These are the following:

All the sulphur colors referred to in the discussion are obtained by the action of sulphur and sodium sulphide on organic compounds, belonging in some cases to the fatty, but in the majority of cases to the aromatic series.

In a well-conducted reaction, whatever may be the mode of preparation of the sulphur color, there is always formed, by the action of the sodium sulphide on the products obtained by the action of the sulphur on the organic compound, a certain amount of hyposulphite of soda.

$$2\ Na_2S + 4\ H_2O = Na_2S_2O_3 + Na_2O + 8H.$$

All the coloring matters of this class thus contain hyposulphite of soda; now it is known that this substance, treated with a mineral acid, yields a deposit of sulphur, while at the same time sulphurous acid is disengaged:

$$Na_2S_2O_3 + 2HCl = SO_2 + H_2O + 2\ NaCl + S.$$

In this we have, therefore, a sure source of free sulphur. On the other hand, it may happen that the reactions or manipulations necessary for the formation of the coloring matters, if incomplete, irregularly conducted, or effected with excess of the reagents (sulphur, for example), may leave some of the sulphur intact, i.e., not changed into organic mercaptan or only partially transformed into sodium polysulphide, the sulphur remaining in the coloring matter as such and in a finely divided state.

This would represent another source of sulphur.

What will now take place in dyeing, if the coloring matter contains free unchanged sulphur? It is almost certain that during the long process of dyeing the cotton will assimilate in the folds of the fibres very variable quantities of this sulphur, which it will be impossible to subsequently eliminate, whatever mode of treatment may be employed.

If the coloring matter has been well prepared, that is to say, if it contains only hyposulphites with traces of sulphur, and the dyer is careful to keep the dye bath very alkaline, there need be no fear of any sulphur depositing during the dyeing process, but as soon as the fixation is effected in an acid bath it is certain that, in case the dyed cotton has not been well washed, and the water which it retains still con-

tains hyposulphite of soda, this hyposulphite of soda will be decomposed, yielding sulphur on the fibre while sulphurous acid is at the same time disengaged.

I specially emphasize the necessity of keeping the dyebath alkaline, because of the fact that the hyposulphite, which is harmless as an alkaline salt, may become a source of danger as hyposulphite of lime. It is known that if a solution of hyposulphite of lime be heated above 60° C, the salt is decomposed with the formation of sulphite of lime and a deposit of sulphur.

Now it may happen to a dyer using a standing bath, and filling up with hard water, that he forgets to add alkali (in the form of soda, for instance) in sufficient amount to keep the bath sufficiently alkaline. Under such conditions hyposulphite of lime is formed, with the result that reactions such as those described above take place—i. e., deposition of sulphur on the fibre or in the dye-bath. This deposit it is impossible to subsequently remove, and it is just as dangerous as sulphur which may be contained in excess, in coloring matters which have resulted from badly-conducted operations.

Resume.—I claim to have proved that the sources of the sulphur are:—

A. Sulphur which accidentally accompanies the coloring matter as a result of defective preparation.

B. The hyposulphites which are contained in all the sulphur colors. These hyposulphites can be decomposed by the acidity of the fixing bath, in case the fixation is effected after insufficient washing. Further, the hyposulphite of lime which is formed in a dye-bath not rendered sufficiently alkaline may be decomposed by the heat.

In the first case, it is impossible to eliminate the sulphur, and this applies equally to that which may come from the decomposition of the hyposulphite of lime in a dye-bath which is badly set or badly managed.

In the second case, it could be said that in the majority of cases the presence of sulphur can and should always be avoided by using the following precautionary measures:—

Liberal alkalinity of the dye-bath, thorough washing of the cotton after dyeing and before fixing, such washing being intended to completely eliminate the hyposulphites which all the coloring matters of this class contain, and if the mode of application entails the use of sulphuric acid in the fixation, the washing which follows must necessarily be sufficient to eliminate every trace of the acid.

These conclusions are experimentally confirmed by the following trials:—

I employed as type of a sulphur color St. Denis Black, in which there is no uncombined sulphur. All the experiments were done with this black on cotton of one and the same quality.

A. Dyed in the ordinary way with St. Denis black, dissolved in soft water, along with common salt and without the addition of soda or sodium sulphide. After dyeing, the cotton was thoroughly washed, the color fixed with chrome and sulphuric acid, the cotton again thoroughly washed, and finally passed through a weak alkaline bath.

B. The dyeing was done as in A, and the color fixed without washing in between, in chrome and sulphuric acid; the cotton was well washed after fixing, as in A.

C. The dyeing, washing, and fixing were done as in A, but the material was simply hydro-extracted before drying, without previous washing.

D. The coloring matter used for dyeing was mixed with 5 per cent. sulphur, and the rest of the operations conducted as in A.

E. The dyebath was made up with an artificially prepared hard water showing 105 degrees of hardness, then treated as in A. The same bath was used a second time, with the addition of more coloring matter and more hard water, so as to make it up to the same strength as in A.

The six lots of dyed cotton thus obtained were not dried, but hydro-ex-

tracted; a sample was detached from each, and the rest were steamed for twelve hours at 103° C.

The following were the results of trials conducted to ascertain the breaking strains, that of the original cotton being taken as 100:

Cotton dyed according to formula A, not steamed but dried between filter paper in the press 95

Cotton dyed according to A and steamed 91

Cotton dyed according to B.....85

Cotton dyed according to C.....40

Cotton dyed according to D.....60

Cotton dyed according to E (1st bath) 87

Cotton dyed according to E (2nd bath) 80

It should be added that for the trials under E the dyebaths are slightly turbid, especially the second, the addition of hard water having caused the formation of precipitates of lime salts, while at the same time a little coloring matter had been rendered insoluble. The use of a water of a doubtful quality in preparing the dyebath necessitates, therefore, the addition of alkaline salts, such as sodium carbonate.—Dr. Chapin in the Journal of the Society of Dyers and Colorists.

Khaki Shades.

These colors, so much in demand now, can be colored on wool or worsted with the anthracene acid colors, which produce shades which are very fast to light and fulling.

They can be dyed in one bath by after treatment with bichromate of potash, or on goods previously mordanted with chrome. The agents for these dyes, Wm. J. Matheson & Co., state that the fastness of the colors produced is in both cases equally good.

By the one dip method the dye bath is charged with 10% Glauber's salt, 5% acetate of ammonia, and the previously dissolved dyestuff. The goods are entered at about 40° C (105° F), and the temperature raised slowly to the boil. Three-quarters of an hour should be occupied in this operation, and the goods should be boiled for ½ hour, then add from 2 to 3% acetic acid in two portions, and boil for twenty minutes, and add chrome.

When dyeing with the regular two-dip process, the pieces are mordanted with 1% bichromate of potash, 1% bisulphate of soda, and rinsed; a fresh bath is then prepared containing the dyestuffs, with the addition of 5% acetate of ammonia. The temperature should be raised very slowly from 40° C. (105 F.) to the boiling point (say within ¾ or 1 hour); continue boiling for ½ hour, then add 2% or 3% acetic acid in two portions, to exhaust the bath, and boil to shade. The anthracene dyes used for these Khaki shades are Acid Brown R, Yellow B N, Blue C, and Acid Brown G.

Those shades can be produced in a still simpler way with the Diamine colors. The shades made in this way are not so fast to the light as are the anthracene colors, but as they are fast to milling they satisfy the requirements in many cases.

When using the diamine colors, the bath is prepared with 2 lbs. Glauber's salt per 10 gallons water, and the dissolved dyestuff added. The temperature is raised gradually from 60° C. (140° F.) to the boil, and the goods boiled for ¾ or 1 hour to shade.

The Diamine dyes used for the Khaki ¼ shades are Fast Yellow B, Brown B, Diamogene, extra, and Fast Red F.

With both Anthracene and Diamine colors, if the water is very calcareous, it should be neutralized with from 4 to 8 ozs. oxalate of ammonia per 10 gallons water, before dyestuff is added. Should additional dyestuff be required to give required shade, the bath should be cooled before adding the dye.

Messrs. Matheson & Co. issue a card containing 20 different Khaki shades with formulas

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Remedy for Electricity in Spinning Room.

Editor Textile World:

Can you suggest a remedy for electricity in the spinning room? We are troubled by the strands clinging together, when the mule draws them from the rollers.

Supt.

To give a remedy for a specific case, it would be necessary to know the surrounding conditions, among other things. Heavy and rapidly moving belts will generate electricity and the difficulty is greater on cold, dry mornings.

The introduction of moisture into the room will often stop the trouble. This can be done by letting steam blow into the room, or better by dampening the air with an air-moistener system. Various other remedies have been suggested, such as running copper wire so the threads can pass over them; mixing soap with the oil emulsion used on the stock; one carder suggests mixing alum in the stock emulsion, but we should hesitate doing this, on account of liability to make stock harsh.

Size of Hangers Required.

Editor Textile World:

I am laying out the shafting for our new mill, and would like to have you inform me whether a hanger with a 14-inch drop would be all right for the centre shaft, and would a hanger with a 20-inch drop be the right size for the main driving shaft?

S. M. R.

It would be necessary for us to know all of the conditions as regards machinery and power, and the shafts in question, before we could risk an opinion upon the proper drop for the hangers. If our correspondent is simply transferring all of the power on one shaft to another, it would, of course, be necessary to have the same sized hangers on each shaft; but, if he is only transferring a portion of the power from the main shaft to a counter shaft, a hanger with a longer drop might answer for the counter. The decision of such questions as these depend altogether upon the conditions existing in the mill, such as power, size of pulleys, etc.

Peruvian Yarns.

Editor Textile World:

Will you please give us the name of some mill which makes a specialty of spinning coarse yarn in singles from Peruvian cotton?

Hamberg.

We have answered by mail, but we would be glad to hear of any other mills making a specialty of yarns inquired about.

Weaving Mohair Goods.

Editor Textile World:

I have had trouble in weaving mohair and worsted goods. The mohair warp yarn would stick together and throw the shuttle from the loom. A fancy weave was used, part of it being a plain weave. Warp was 2/36 mohair; filling, 2/32 worsted. Can you suggest a remedy?

Watnot.

The trouble is caused by the long fibres of mohair clinging together, preventing threads from separating easily. This trouble would be more pronounced in a plain weave, where each thread must separate from its next neighbor at every pick. The closer the warp is set in the reed, the more difficulty of this kind would you have.

We would advise you to size the warps well. This pastes the hairs down on the thread and will also prevent the threads chafing or wearing away by contact with the reed, especially when a large number of picks are being put in the warp.

Sizing Egyptian Cotton Yarn.

Editor Textile World:

Can you please tell me why Egyptian cotton yarn does not take sizing as well as yarn made from Peeler cotton?

Egypt.

One peculiarity of Egyptian cotton fibre is the excess of oleaginous matter, or wax, on its surface, which resists the absorption of size or other liquid matter, just as the feathers on a duck resist water. The Peeler cotton has less of this waxy surface, and takes the size better. A little blue vitriol or turpentine added to the sizing has the effect of dissolving the waxy coating on the fibre, and makes it take the sizing readily. For 100 gals. of sizing add a piece of blue vitriol as

big as a walnut, or a similar amount of turpentine.

School for Knitting Manufacture.

Editor Textile World:

Please give me the address of the best textile school in this country which teaches the manufacture of knit goods, especially dyeing and finishing of hosiery.

South.

None of the textile schools have a knitting department, where instruction is given in the manufacture of knit goods. In the dyeing departments of the Philadelphia and Lowell schools you would get a great deal of information, that would be of value in dyeing hosiery.

Information Regarding Rag Picking.

Editor Textile World:

Can you inform me where I could buy a rag picker on the instalment plan? Is there any woolen company doing business in this country, from whom a rag picker could be bought, and who would also furnish the rags to be picked? Could a profit be realized from one or two rag pickers, or buying rags and picking them?

S. K.

We do not know of anyone who would sell a rag picker on the instalment plan, or furnish rags to be picked. There are parties in various parts of the country who are doing a custom business for mills with two or three pickers. Most of them have breaker cards for carding stock, if required, and run the machinery by water power. It requires considerable power to run rag pickers. The business of making shoddy is now conducted by large concerns who have large plants for carbonizing, picking, carding and coloring the stock, and ample capital. It is like every other business, profitable when properly conducted, in good times, but subject to the vicissitudes of market conditions. If our correspondent had a power plant and necessary machinery for two rag pickers, he might make arrangements with local mills to do work for them, in addition to making shoddy for sale. In this way, there would be a fair chance to make the business pay moderately. We send by mail address of party from whom you can buy rag pickers.

Is Wood Silk Made in This Country?

Editor Textile World:

I understand that artificial silk, made from wood, is manufactured successfully in this country, and is being used by some cotton mills, as well as by silk mills. Can you give me any information as to where this may be obtained?

C. J.

We have understood that experiments were being conducted by a mill not far from New York City, but had not learned that their product was now on the market. We should be glad to know if such is the case.

Kinky Filling.

Editor Textile World:

We are troubled with kinky filling in tickings, causing a rough surface on the cloth. How can it be remedied?

Kink.

There are many causes for this trouble on such goods as tickings. If the yarn is twisted too hard, it will kink easily, and this tendency can sometimes be removed by steaming. An experienced cotton manufacturer says that he is careful to have the yarn contain only the standard amount of twist, and by letting it stand for twenty-four hours before weaving, he finds it unnecessary to steam the yarn, providing there is proper friction at the eye of the shuttle.

When weaving ticking, it is necessary to have a clear, open shed for the shuttle to pass through. If the shed closes too late, or the shuttles rebound in the box, kinky filling usually appears. The warp should be woven as tightly as possible, consistent with good weaving. If the above course is followed, we think there will be no trouble with kinky filling, due to fault in the weaving.

This trouble may be caused in the spinning room, by the carriage getting away from the roller beam too late, causing the yarn to kink at point of spindle, and in such cases the kinks could be discovered before yarn was woven. Such kinks, made in the spinning, no amount of steaming will take out, as steaming is a preventative, and not a cure, for kinky yarn. When such a trouble arises in a mill, and the exact cause is not known, the best plan is for the overseers of the rooms, in which the cause might exist, to get their heads together and have a friendly consultation on the subject, and it will materially assist in locating the cause, if each overseer is as ready to locate it in his own room, as he is to locate it in another department of the mill.

Book on Dressing.

Editor Textile World:

What is the latest and best book on Dressing?

F. C. S.

We believe there is no book on dressing, such as our correspondent asks for. This department of the mill is treated incidentally in some of the publications on weaving.

Degras.

Editor Textile World:

What is Degras, and how is it used in woolen mills? Consul.

Degras is grease from wool, which is the refuse product of wool scouring. Most of it is imported from Europe, although, in late years, American wool scouring mills have been utilizing this waste product, and there are a few firms who sell the American Degras. Its greatest market is to tanners and curriers of upper leather, who use it to soften or "stuff" the hides. The only use that we know that it has in textile mills is in the preparation of oil for stock. It is mixed with a higher priced mineral oil, and brings the emulsion down to a very much lower cost. This mixture is usually made by the oil dealers, although there are some mills who make their own emulsion. We believe that the largest use of Degras for textile purposes is in Philadelphia and vicinity; indeed, dealers in the trade say that 80 to 90 per cent. of the Degras that goes into textile mills, is used in and around Philadelphia. Western mills use it to some extent, but very little is used in New England.

Cutters for Fine Index Jacquard Cards.

Editor Textile World:

Please give me the address of one or more firms who cut cards for Thos. Halton's fine index jacquards. Designer.

We have answered by mail.

Check System for Keeping Track of Work in Knitting Mills.

Editor Textile World:

Can you tell me of some system of checks or tags used to keep track of the work in knitting mills, so as to check dishonesty and carelessness on the part of employees? Moh.

E. H. Foster & Sons of Cohoes, N. Y., have a printed check system, which we understand is patented and which is in very general use among knitting mills in that district. It consists of a slip or ticket perforated into a number of different sections corresponding to the different processes which the goods have to go through and the different operatives who handle them. As one operative passes them along to the next, the proper piece is detached and handed in as a basis of payment of work, and if the goods do not come through at the end to correspond with the slips given out in the beginning, or certain work is poorly done, the missing or damaged pieces can be readily traced back to the operative who is responsible.

Device to Displace Picker Sticks.

Editor Textile World:

Will you kindly inform we what, if any, efforts have been made to improve or displace the picker stick now in use on looms to operate the shuttle? Lincoln.

Inventors are constantly at work to find some other means of operating the shuttle. A loom invented by a Californian, which was on exhibition a few years ago in Boston and New York, has, we believe, no picker stick. Our correspondent could get the drawings and full information of this, and any other patented devices, from the patent office reports, which are probably on file in the public library of his city. If not there, they could be found in the Boston Public Library.

New Publications.

The Blue Book for 1900. We have received "The Twentieth Century Edition" of this well-known publication. The office edition has been enlarged by the addition of many pictures of prominent mills. It contains a directory of all the textile establishments in the United States and Canada, with the dry goods commission merchants, raw material dealers and textile supply directory. The book is 100 pages larger than the previous years, and the same accuracy and care in compilation are apparent. Received from the Davison Publishing Co., 401 Broadway, New York. The price of office edition, $3. Travelers' edition, $2.50.

New Catalogues. The well-known firm of James Leffel & Co., Springfield, Ohio, builders of water wheels, steam engines and boilers, have recently issued some new catalogues, illustrating and describing their various lines of work. Their Turbine Water Wheel catalogue contains 140 pages, and shows some of the particularly fine work in this line which they have done for some of their customers, together with descriptions of same. They have also issued a new catalogue relating to their Cascade Water Wheels, which are adapted for the higher heads, where turbines are not practicable, and same is replete with power tables and other useful data, of interest to parties contemplating utilizing or improving water powers having high heads.

A new pamphlet "H" has also recently been issued by this company, illustrating and describing the various sizes and styles of engines and boilers they are building, including throttling and automatic engines, portable and stationary boilers. Copy of any of foregoing catalogues will be sent to parties interested, on application, stating which catalogue they desire, and what their requirements may be.

An Index of Publications for Dyers. New York: W. J. Matheson & Co. In this 24-page pamphlet are classified and indexed the various publications issued from time to time, by W. J. Matheson & Co., on their dyes for coloring and printing.

It can be obtained free upon application to Messrs. Matheson & Co., and should be in the possession of every mill and dyer, as it enables one to secure the publication best suited to his particular wants.

An examination of the index cannot fail to impress one with the firm's extensive line of dyes for coloring and printing cotton, wool, unions, silk, felt, jute, paper, leather, straw and soap.

Color Combinations on Woolen Cloth. New York: Victor Koechl & Co. This is a color card, containing 40 shades on woolen cloth, and opposite each one are samples, showing the shade produced by each of the dyes required for the compound shade. It is a very interesting idea, and strikes us as being one of great value.

This card is series M, No. 1, and we will doubtless see more on this same plan, which gives the dyer so clear an idea of his colors and dyes. Application has been made for a patent on this arrangement of samples and we advise every dyer and manufacturer to obtain a copy of this card.

Card Grinding Machinery. Worcester, Mass.: B. S. Roy & Son. The 1900 catalogue and price-list of the card grinding machinery manufactured by this well-known firm has just been received. Illustrations and descriptions are given of the various styles of traverse and roller grinders, turning lathes, grinding wheels and tools for carders, such as ratchets, clamps, gauges, card hammers and belt sleeve shippers.

American Blower Co. New York; London; Chicago. Perspective views and plans of the blowers, engines and heating apparatus and their parts are shown in the price-list and catalogue issued by the American Blower Co.

The tables and references are very complete and enable a prospective purchaser to order for any particular purpose or place as well as if the machines were before him. Rules for determining size of fans are given, also instructions for piping and setting up fans, tables giving areas of circles, weight of pipe per foot, pressure of air and horse-power of belts.

The Arlington Machine Works.

Mr. Arthur Birch, who, with his brother Albert, formerly constituted the firm of Birch Bros., is now conducting business under the name of the Arlington Machine Works, building machinery for bleacheries, print works and woolen and worsted finishers, with works at Arlington Heights, Mass. Mr. Sydney Birch, who was formerly associated with Birch Bros., and later with the Rusden Machine Co., as designer, is now with the Arlington Machine Works, and his knowledge of the business and acquaintance in the trade will be put to best advantage in his new sphere. The Arlington Machine Works report that they are very busy, with good orders ahead. They are just now getting out some special machinery for washing Madras shirtings.

The American Trimmer.

The American Machine Works., 420 Liberty St., Philadelphia, Pa., are busy at present on their trimmer. This machine has an oscillating knife fastened to a vertically moving hardened steel knife bar, which is accurately fitted to the groove on the barrel of the trimmer.

The parts are so constructed that a high speed can be maintained with a minimum amount of friction and wear. Vulcanized fibre gears connect the trimmer and sewing machine shafts, thus avoiding the noise of metal gears, and it is claimed that these fibre gears are more durable than steel. The width of the seam can be readily changed by adjusting the barrel, which carries the knife.

This trimmer is simple in construction, and requires but little attention from the operator. It can be fitted to a Willcox & Gibbs, Union Special, Singer Hook, or Wheeler and Wilson No. 10 machine.

Employees Enjoy an Excursion.

On Saturday, July 28th, the Worsted Mills of Thos. Wolstenholme, Sons & Co., were closed, on account of the excursion given the employees to Atlantic City. The day was very fine and an immense crowd went down to enjoy the breakers. Each guest was provided with an elegant dinner, generously given by Mr. Thomas Wolstenholme, and judging by the number partaking of same, the excursion was a decided success.

Persons Seeking Homes.

Persons seeking homes or investments, or firms and corporations seeking locations in the South and who desire information about Tennessee would do well to address Robert Gates, special industrial and immigration agent, Louisville & Nashville R. R. for Tennessee, at Nashville, Tenn.

Send for a Free Sample.

The Stephenson Manufacturing Company of Albany, N. Y., report that after several months' test, their Bar Belt Dressing has been adopted for use in the Government Arsenal at Watervliet, N. Y.

While no stronger proof of merit could be desired, still our readers might be interested to know that this dressing has been used for several years by the Washington Mills at Lawrence, Mass., the Botany Mills at Passaic, N. J., the Brainerd & Armstrong Silk Mills at New London, Conn.; while only recently the Stephenson people were favored with a duplicate order from Robert H. Foerderer of Philadelphia.

Mr. Foerderer is well known throughout the world as a manufacturer of Vici Kid, and he certainly ought to know what is good for leather.

The Stephenson Company say that the responses by our readers to the invitation suggesting that they write for a free sample, which is sent by mail, has been quite general; at the same time they again urge that this invitation be taken in good faith, and that a sample sufficient to give a fair test will be sent immediately upon request, postpaid.

Renowned for Their Grandeur.

Conspicuous in many ways are the White Mountains of New Hampshire. The region is one grand wonderland, and every turn brings the visitor to some attraction in which Nature's marvelous embellishments are displayed. The famed "Crawford Notch," "The Flume," "The Old Man," "Elephant's Head," "The Lake of the Clouds," the Gulf, the ravines and cascades are but a few of the many more notable features with which it would seem this region has been so extravagantly endowed. One hardly realizes how imposing the mountain surroundings are until a visit has been paid them, but a slight idea of some of their principal attractions may be gained from perusing the "Mountain Handbook" issued by the Boston & Maine Railroad, and for pictorial views of the mountains the Boston & Maine portfolio known as "Mountains of New England," will prove interesting and instructive. The first mentioned book is sent for a two-cent stamp, the latter for six cents in stamps to any address upon application to the Passenger Department of the Boston & Maine Railroad, Causeway Street, Boston, Mass.

The National Association of Credit Men.

This association has issued a circular letter, stating that they have learned that dunning circulars are being sent to merchants throughout the country by a concern styling itself "The National Credit Men's Association."

The similarity in the names has caused many of the recipients of the dunning circulars to think they came from the first-named concern. The letter states, however, that the National Association of Credit Men is not a collection agency and has no collection department.

Lowell Textile School.

When the new buildings are erected and equipped with machinery for this school, it will be one of the best plants in the country for instruction in textile manufacturing. The sum of $70,000 will be expended for building and equipment. The plans have not yet been decided upon. The building committee is composed of A. S. Cumnock, A. S. Covell, J. T. Smith, Alvin S. Lyon, and Jacob Rogers. The committee is considering several sites for the new buildings, and intend that there shall be plenty of room for future growth.

Although the school is but three years old, it is in a very flourishing condition. Last year there were registered 331 students. Of these, 79 were in the day classes, and 252 in the evening classes. A large number are already registered for the coming year, which promises to show an attendance largely in excess of 1899. In addition to the incidental courses in weaving, already established, a fifth regular course in this branch will be given to the day students. The woolen department will pay especial attention to the double spinning of yarn, 10, 12 and 14 runs. The worsted department will spin from yarn varying from 45s to 100s. Plans are also being formed for courses in French drawing and worsted mule spinning, and for a course in mechanical engineering for evening students, in charge of Prof. Crosby.

Improving the Lustre of Mercerized Yarn.

This method consists in keeping the yarn for about forty minutes in a chamber in which steam, with a pressure of about 22 pounds, has been introduced. This steaming is done either before or after the goods have been subjected to the tension of the mercerizing process. It is claimed that this process gives a superior lustre, and more silky handle to the cotton, and does not destroy its affinity for the dyestuff, or its elasticity.

American Appraisal Company.

The following letter speaks for itself, as to the value of a careful appraisal of insured property, and the careful manner in which the American Appraisal Co. does its work:—

Baltimore, June 1, 1900.

The American Appraisal Co., New York:

Dear Sirs:—Replying to your esteemed favor of the 29th ult., beg to say, that we are only too pleased to add our testimonial to those of other houses, for whom you have done similar work. We can say that for the first time we are actually in possession of facts, and had we known of your company, or a similar one, we would long ago have had such an appraisal made.

We are very much pleased with the details, into which you went, and with the manner in which the work was executed.

Trusting that you will have the continued success which you deserve, we remain,

Yours truly,
Wm. Knabe & Co.

The American Appraisal Co.,
804 Park Row Bldg., New York City:

Gentlemen:—Referring to your inquiry in the matter of the appraisement of our factory, we take pleasure in saying that it far exceeded our expectations.

It is highly satisfactory and done in a very thorough and comprehensive manner. We value it highly and commend your methods.

Yours very truly,
The New England Watch Co.,
W. J. Cummings, Gen'l Mgr.

—"A copyright gives the author or the publisher the exclusive right of multiplying copies of what he has written or printed. To infringe this right, a substantial copy of the whole, or of a material part, must be produced. Those printing and those publishing and selling infringing books are equally liable to the owner of the copyright, and if only portions of a copyrighted book are so intermingled with the rest of the piratical work that they cannot be well distinguished from it, the entire profits realized must be accounted for." Quoted from a pamphlet published by E. G. Siggers, Patent Lawyer, Washington, D. C. Sample copy free.

—The Imperial Steel Works, owned and operated by the Japanese government, have just placed an order for the complete equipment of the plant with Cross Oil Filters, with The Burt Mfg. Co. of Akron, Ohio. As The Burt Co. were in competition with the best manufacturers of filters in Europe and other American makes, they regard it as a distinct triumph for the Cross Filter. The Imperial Steel Works are probably the most important plant of the kind in the Flowery Kingdom.

Sauerbeck's Tables.

A. Sauerbeck, in his monthly statement relating to the prices of commodities, gives the following index numbers of the prices of 45 commodities, the average of the 11 years 1867-77 being 100:—

Average.	
1878-87	79
1890-99	66
1889	72
1893	88
1896	61
1897	52
1898	64
1899	68

Monthly Numbers.	
December, 1889	73-7
February, 1895	60-0
July, 1896	59-2
April, 1899	66-1
December, 1899	72-3
January, 1900	74-0
February, 1900	75-1
March, 1900	75-7
April, 1900	75-6

For the first time since March, 1899, the monthly index number shows no further progress.

Large Mechanical Draft Fans.

The New York Blower Co., Bucyrus, Ohio, illustrate the advance made in recent years in the adoption of mechanical draft in general, and their own part in this advance in particular, by an illustration of two of the largest fans ever made for mechanical draft, which were recently shipped from their works.

They will send copies of this picture, suitable for framing, to anyone interested.

Lythite.

The Frank S. De Ronde Co., 54 John St., New York, report that their sales of Lythite Cold Water Paint are increasing in all parts of the country, particularly among the large mills of New England. It is known by this trademark.

It is being used extensively for both interior and exterior coating, and is particularly well adapted for the inside walls of power houses, engine rooms, storehouses, elevator shafts, etc.

The De Ronde Co. state that it can be used on the walls and ceilings of rooms, where the finest machinery is operated, as the jar of the machinery will not crack the paint and cause it to chip or peel off.

—The continued demand for the overlock machine built by the Willcox & Gibbs Sewing Machine Co., 658 Broadway, New York, seems to indicate a healthy tone in the underwear line, with no apparent falling off.

Waterproofing Woolen Goods.

The following is a method of waterproofing woolen goods. No machinery is needed, and it is said to give very satisfactory results: Twenty-two pounds of sugar of lead and the same weight of alum are separately dissolved in boiling water, then 26 pounds of acetate of alumina. The latter is, however, better ordered from the druggist in the liquid state. The three solutions are poured into the cask and allowed to stand over night. Meanwhile, 200 grms. of gelatine and the same weight of isinglass are stirred with cold water. Next morning the mineral solution is drawn off into a separate vessel, care being taken not to disturb the sediment, which would spot the cloth. To the clear solution are added 53 gallons of hot water and the gelatinous preparations which have been previously boiled and strained. This is the waterproofing liquid. It may be applied through the nose of a watering can, but an impregnating machine will, of course, be more satisfactory. In any case, the cloth must be well soaked before it comes in contact with the mixture.

International Sprinkler Company.

The International Sprinkler Company is meeting with such marked encouragement and success that it has found it necessary to open a Southern department with headquarters at 801 Prudential Bldg., Atlanta, Ga. Mr. K. L. Walling, who for many years has been well known in insurance and sprinkler work, has been appointed Southern representative.

This company is showing evidence of the broad and active business management of Mr. Clarke Merchant, who is its principal stockholder and president. Mr. Merchant is giving the same energetic attention to the business that he gave to the development of the commercial house of Merchant & Co., Inc., and any representations made by the International Sprinkler Co. will be found as trustworthy as have been the statements of Merchant & Co., Inc., for more than a quarter of a century. The company report a continued increase in its orders, and the inspection of its work has shown it to be the equal of the best.

The International Sprinkler Co. will hereafter compete actively on the ground, for all Southern contracts, and parties about to install sprinkler equipments will find it to their interest to secure this company's proposition before making a selection.

Graphite for Automobiles.

The Joseph Dixon Crucible Co. inform us that graphite is being used for lubricating the cylinders of automobiles, where the high temperature is apt to char mineral oils, when used alone.

It is stated that the temperature of a gas engine cylinder is from 1200 to 2000 degrees F., and that graphite withstands this extreme heat.

Special graphite lubricants are prepared for the gears of both electric, steam and gas motors.

Those interested in the subject of graphite lubrication should write to the Joseph Dixon Crucible Company, Jersey City, N. J., who are authorities on the subject of graphite.

Textile Patents.

(Continued from page 219.)

Loom Shuttle. 653,969. J. C. Sergeson, Philadelphia, Pa.

Loom, Thin Place Detector. 653,589. J. L. Oswalt, Spray, N. C., assignor to the Draper Co., Portland, Me., and Hopedale, Mass.

Loom, Upright. 654,055. G. O. Draper, Hopedale, Mass., assignor to the Draper Co., same place and Portland, Me.

Measuring Machine, Cloth. 654,229. T. J. Cloud, Killeen, Tex.

Napping Machine. 652,843. N. H. Grosselin, Sedan, France, assignor to Chas. Heap, Rochdale, Eng.

Shuttle. 653,114, 653,148. E. Oldfield, Norwich, Conn.

Shuttle Guiding Device. 652,864. P. Schmidt, Vienna, Austria, Hungary.

Spinning and Twisting Frame. 653,638. Simeon Berard, Fall River, Mass.

Spinning Frame Attachment, Wool. 653,836. A. Avery, Manchester, N. H.

Spinning Machine. 654,081. P. Wallace, Philadelphia, Pa.

Spinning Machine, Mule. 653,864. Wm. H. Goldsmith, Central Falls, R. I.

Spinning Ring. 654,468. F. M. Marcey, Worcester, Mass., assignor of one-half to the Draper Co., Portland, Me. and Hopedale, Mass.

Threads, Machine for Clearing Silk or Other Textile. 653,174. Chas. G. Diederichs and Marie A. E. Marquelet, Ste. Colombe les Vienne, France.

Twisting or Doubling Machine Traveler. 653,926. J. W. Cook, Manchester, Eng.

Water-proofing Fabrics. 653,716. J. T. Van Gestel, New York City.

Wool, Apparatus for Extracting Grease from. 654,530. W. Erben, Philadelphia, Pa.

Wool, Extracting Grease from. 654,529. W. Erben, Philadelphia, Pa.

Wool Washing Machine. 654,170. G. Malard, Tourcoing, France.

Woven Tubular Fabric. 653,918, 653,919. A. De Laski, Trenton, N. J.

Yarn Balling Machine. 654,351. Walter McGee and David McGee, Paisley, Scotland.

Yarn, Spooled. 653,832. Eugene Tymeson, and Reuben Borland, Yonkers, N. Y., assignors to Alex. Smith & Sons Carpet Co., same place.

Colonial Black.

F. E. Atteaux & Co., 176 Purchase St., Boston, are bringing out a new black for cotton, called "Colonial Black," which they claim has remarkable strength and gives great depth of shade.

Norristown Covering Co.

The extension of the plant at Norristown, Pa., recently noted in our columns, is completed, and enables the increasing business which has come to this firm to be attended to promptly.

Printing Knit Fabrics.

We have received a number of inquiries from interested readers about the printed knit goods illustrated in the last issue of the Textile World. John Capstick & Sons, Columbia Print Works, Montville, N. J., are prepared to do this sort of work, and would be pleased to correspond with knit goods manufacturers in reference to it.

Patent Decision on Winding Machinery.

A decision, which will be of interest to textile manufacturers, has been made by the United States Circuit Court, in the patent case, J. R. Leeson vs. The Willimantic Linen Co. This case has been in the courts for years and the decision confirms the validity of the patents, which related to the inventions of Simon W. Wardwell. Following is the text of the decision:

"Ordered, adjudged and decreed that the patents on which this suit was brought, to wit, Letters Patent granted to Simon W. Wardwell, Jr., for an Improvement in Regulators for Thread Winding Devices, dated November 28, 1893, and numbered No. 509,413, and Letters Patent granted to Simon W. Wardwell, Jr., for an improvement in Thread Winding machines, dated December 18, 1894, and numbered No. 531,081, are good and valid in law; that the said patentee was the original and first inventor of the invention described and claimed in each of said Letters Patent, and that the title thereto and to the inventions described and claimed therein is vested in said complainant; and that the said defendant has infringed the said Letters Patent Nos. 509,413 and 531,081, and the exclusive rights of the complainant under the same, by making and using machines containing and embodying the said patented improvements described and claimed in the said Letters Patent Nos. 509,413 and 531,081."—N. Shipman, Circuit Judge.

Open a Branch House.

The Saginaw Manufacturing Co., Saginaw, Mich., have opened a branch house at 35 So. Canal St., Chicago, Ill. Mr. G. A. Gilbert, a member of the firm, will be manager of this Chicago branch, where a very complete stock of the Gilbert Wood Split Pulleys will be carried. This will enable them to respond still more promptly to the requirements of their increasing business.

X-Rays in the Silk Industry.

X-rays have found a new field of employment in the silk industry. They have already been used to select cocoons and enable the observer to ascertain, without opening the cocoon, if the animal inside is of the male or female sex. The eggs which the female carries contain enough mineral matter to be detected by the process. A German chemist uses the X-rays to determine whether silk has been "weighted," and to what extent. As the weighting is done in black silks with salts of iron, the presence of these is easily discernible, and this method of detection may be employed in addition to the more complicated chemical analysis, or in place of it.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Anniston. Work has now been started on the Anniston Yarn Mill Co.'s plant. The mill will be twice the original size. The main building will be 75 by 264 feet, two stories, with boiler and engine rooms 36 by 72 feet.

—*Alabama, Athens. C. E. Frost is secretary and treasurer of the Athens Cotton Mill Co., capitalized at $50,000, which contemplates beginning operations March 1st, 1901, making single and twisted yarns. The mill will have 2500 spindles, which will be run by steam.

—Alabama, Cullman. It is reported that P. Sid Jones, of the Louisville & Nashville Railroad, is interested in project now afoot for a cotton mill at this place.

—*Alabama, Huntsville. The contracts for the erection of the new cotton plant here by Arthur H. Lowe will be let about August 1st.

—*Alabama, Jacksonville. We now learn that Arnold B. Sanford, 67 Chauncy St., Boston, is interested in the new cotton yarn mill projected at this place. The concern will be capitalized at $150,000 with Geo. P. Ide as treasurer and Mr. Sanford as general manager. The yarns (colored) will be sold through the American Cotton Yarn Exchange at Boston.

—*Alabama, Opelika. The main building of the Opelika Cotton Mills, upon which work of construction has begun, will be 80 by 214 feet, 2 stories, with four-story tower and engine and boiler rooms, 37 by 40 feet and 31 by 42 feet respectively. A cotton warehouse, 100 by 200 feet, will also be built and about 50 cottages for operatives. This mill, of which J. R. Hardaway is general manager, will begin operations with 6500 spindles, which will eventually be increased.

—Arkansas, Monticello. A recent report states that W. A. Brown, president of the Board of Trade is interested in the project of a cotton factory at this place. Since mentioning the project before, the citizens have subscribed $75,000 toward the enterprise.

—Arkansas, Pine Bluff. The plant of the Pine Bluff Mill & Elevator Company is to be remodelled for a cotton mill. They contemplate equipping the building with 5000 spindles for manufacturing yarns. As soon as they can secure the services of a competent man to superintend building operations and the plant, when completed, they will place all contracts. E. D. Russell, who is secretary, has the matter in charge.

—*Canada, Hamilton. Work has been started on constructing the new mill for the Imperial Cotton Company. It is expected to have the mill completed in the fall, and give employment to about 400 people.

—*Georgia, Calhoun. It is reported that the efforts to secure a $200,000 cotton mill for this place will prove successful, as a plan has been announced in which a company of the state will furnish $150,000, if local investors buy $50,000 worth. W. P. Dodd, mayor of this place, is interested.

—*Georgia, Carrollton. The new Mandeville Cotton Mills are now in operation. About all the machinery has been installed.

—*Georgia, Columbus. The machinery is now being installed in the Columbus Mfg. Co.'s new mill, and it is thought quite possible to start operations by the first of November. This mill, of which F. B. Gordon is president, will have an equipment of 20,000 spindles.

—*Georgia, Columbus. The foundations have been laid for the new mill to be constructed for the Southern Wadding Mill, in which E. N. Clemence holds an interest.

—*Georgia, Covington. Work is now being pushed on the buildings of the Covington Cotton Mills, of which T. C. Swann is president; W. C. Clark, secretary and treasurer and O. L. Porter, general manager.

—*Georgia, Dublin. The Dublin Cotton Mills, about which previous mention has been made, will manufacture three yard sheeting. In addition to the 5000 spindles the plant will have 170 looms.

—*Georgia, Eatonton. The Putnam Cotton Manufacturing Company has been formed for establishing a yarn mill at this place.

—*Georgia, Fitzgerald. Subscriptions are now being received for the new cotton mill at this place, project concerning which was mentioned some time ago. This is the mill in which W. R. Brown, M. Buice and D. Holmes are interested. It is proposed to let the contracts in a short time in order to have the mill completed and running in about four months.

—*Georgia, Fitzgerald. At a recent meeting of the stockholders of the Irwin County Cotton Mills, $60,000 was subscribed toward the building. Application has been made for a charter.

—*Georgia, Hawkinsville. It is reported that ground will soon be broken for the erection of the Hawkinsville Cotton Mills, which the directors hope to have in operation by Jan. 1st, 1901. In reported data in an earlier issue, it was thought that the plant would be ready by Sept. 1st, but this will not be.

—*Georgia, Thomas. The John E. Smith Cotton Mills Co., of which Jno. E. Smith is president and W. H. Murray, superintendent, started operations during July. No. 24's skein and warp yarns will be made.

—*Georgia, Madison. The Madison Cotton Mills, which have been incorporated with capital of $100,000, L. H. Fargason, president and treasurer and R. W. Parker, secretary, will manufacture yarns. They expect to begin operations by the 1st of March, 1901. No machinery contracts have yet been placed. The Chinese troubles have delayed matters.

—*Georgia, Newnan. Contract has been let for building the new addition to the Newnan Cotton Mills, reported on some time ago. The new mill will be equipped with 6300 spindles and will manufacture a fine grade of yarns. It is also reported that the machinery has all been contracted for.

—*Georgia, Tifton. The Tifton Cotton Mills have been organized with H. H. Tift as president; S. M. Clyatt, vice-president; and L. G. Manard, secretary, treasurer and general manager.

—*Georgia, Valdosta. At the first annual meeting of the Strickland Cotton Mills, the old board of directors was re-elected, with B. F. Strickland as president, E. W. Lowe, secretary and treasurer. Part of the machinery has arrived, and is now being placed in position. It is thought that the mill will be in full operation early in October.

—*Louisiana, Hammond. The Hammond Cotton Mill Co., a concern organized for purpose of establishing a yarn or cotton mill, is now advertising for a site on which to build.

—*Louisiana, Lake Charles. We have been informed by John W. Rhorer, that the company has not yet been organized for the projected cotton mill at this place. They propose incorporating with capital stock of $100,000, to erect a mill for making cotton twine, rope, osnaburgs, checks, sheetings, etc., with an equipment of about 3500 spindles. They are now receiving estimates on the cost of full equipment of machinery and the building.

—*Louisiana, Monroe. Work is progressing on the new Ouachita Cotton Mills, of which Uriah Millsaps, is the president. The plant, which will have a capacity of 15,000 spindles, will be ready to start operations about the 1st of January.

—*Massachusetts, Easthampton. Work has been started on construction of the new mill of the Glendale Elastic Fabrics Company.

—*Massachusetts, Taunton. All the departments of the Winthrop Mill are not yet running, but it is hoped to have the plant in full operation within two weeks.

—Mississippi, Gloster. Efforts are now being made to establish a cotton mill at this place. It is proposed to organize a company with capital stock of $75,000.

—*Mississippi, McComb City. The McComb City Cotton Mills, capitalized at $150,000, and of which J. J. White is president and W. R. Caston is treasurer, expects to begin production of goods about December 1st, 1900, making 3 to 4 yard goods for export trade. As previously stated the plant will have equipment of 5000 spindles and 160 looms.

—*Mississippi, Tupelo. The contract has been let for the erection of the Tupelo Cotton Mills. The new plant will have an equipment of 5000 spindles and 160 looms for manufacturing cotton cloth. J. M. Thomas is secretary.

—New Hampshire, Newmarket. Work has been started on the erection of the new mill for the Newmarket Mfg. Co. The building, which will be of brick, 200 feet square, three stories high, with the latest mill construction, will be used for manufacture of fine goods. It is expected have the building ready for machinery about November, in order that the plant can be ready for operations by the first of the year.

—*New Jersey, New Brunswick. Site has been purchased by Johnson & Johnson, upon which they will erect a large cotton mill, mentioned in an earlier issue. F. P. Sheldon is the architect. Main building will be four stories high and basement, and the other buildings, two stories each.

—*New Jersey, Passaic. The Brighton Mills, now at West 23d St., New York City, with salesrooms at 83 Leonard St., which are to erect a large mill here, expect to begin operations in the new location about October, 1900. The mill will have 3500 ring spindles and 160 looms for making crochet quilts, special fabrics of combed Sea Island and common yarns and combed Sea Island yarns. The loom and machine works, of which William L. Lyall is superintendent, also connected with the cotton mill, will occupy part of the new structure. Of the cotton mills, James Lyall is president, William L. Lyall, treasurer and secretary, and Wm. O. Smith, superintendent.

—*New York, Columbiaville. Operations will be started about the 1st of September in the Hanover Yarn Mill, established here by J. A. Hover for manufacturing yarns.

—*New York, Schenectady. The new lace mill at this place, which is now under construction, will be operated under name of Alb. & E. Henkels, which is same name used in Germany. Mr. Attenborough is manager of the mill here. Preparations are now being made for installing the machinery.

—*North Carolina, Charlotte. The Barnhardt Manufacturing Co. has been incorporated with capital stock of $50,000 by E. C. and T. M. Barnhardt and Dr. C. A. Misenheimer. Cotton goods and fabrics will be manufactured.

—*North Carolina, Concord. Work is now progressing on the Gibson Cotton Mill, the walls being partially completed.

—*North Carolina, Elizabeth City. At a meeting of the stockholders of the Elizabeth City Knitting Mills, W. C. Glover was elected president; R. B. Martin, secretary and J. A. Willard, general superintendent. The mill, which is now running full, will shortly begin night work.

—*North Carolina, Goldsboro. Work is progressing on the new mill to be erected here by the Borden Mfg. Co., recently incorporated.

—*North Carolina, King's Mountain. The machinery is now being installed in the new Cora Cotton Mills. The boilers and engines have been placed in position.

—*North Carolina, Kings Mountain. Although the plant of the Lulu Cotton Mill has not been quite completed, they have already started spinning yarn. An addition is to be made to the mill shortly.

—North Carolina, Lagrange. The Grange Manufacturing Company has been incorporated with capital stock of $50,000 by R. F. Broad, G. F. Smith and C. L. Ives. The concern will manufacture cotton goods, compress and gin cotton, etc.

—*North Carolina, Lumberton. The Lumberton Cotton Mills have been organized, with R. D. Caldwell as president. The capital stock will be placed at $175,000.

—*North Carolina, Shelby. The Shelby Cotton Mills, about which we have previously given data, was put in operation about July 12th.

—*North Carolina, Smithfield. J. D. Rose of Rocky Mount has been awarded contract for the erection of the Smithfield Cotton Mills. The main building will be 75x204 feet, two stories high. The mill will be equipped with electric lights, water works and fire protective system.

—North Carolina, Wadesboro. The Anson Cotton Mill Company has been chartered to build a mill at this place.

—*Rhode Island, Pawtucket. The Royal Weaving Co., now at Central Falls, have purchased land and will begin erection of a large mill at once.

—*Rhode Island, Woonsocket. The new weave shed now under construction for the Social Manufacturing Company will probably be ready in about four or five weeks. One shed will be supplied with looms now in the Nourse Mill, with some additional new ones, while it is said that the latter plant will be used as a yarn mill.

—*South Carolina, Greenville. The contract has been awarded by the F. W. Poe Manufacturing Company, for the erection of their new mill, which will be four stories high, and which will be a duplicate of the present plant of 25,088 spindles and 752 looms.

—*South Carolina, Greenwood. The plant of the Hartsville Cotton Mills, recently incorporated with capital stock of $200,000, will be equipped with 10,000 spindles and 300 looms for making fine cotton goods. C. C. Twitty, of Spartanburg, is president. It is reported that the company will start building at once.

—South Carolina, Inman. Col. T. C. Duncan of Union and J. A. Chapman, of Spartanburg, are now interested in the project of a new cotton mill at this place, which has been mentioned in previous issue.

—South Carolina, Johnston. The Johnston Cotton Mills have been incorporated with capital stock of $50,000. Among the incorporators are: S. J. Watson and B. F. Lewis, of this place.

—*South Carolina, Jonesville. The directors of the Alpha Cotton Mills have decided to issue $25,000 worth more of stock in order to enlarge the plant, which is now under construction, from 5000 to 7000 spindles.

—*South Carolina, Orangeburg. W. G. Smith, president and treasurer of the Orangeburg Manufacturing Company, states that the plant will probably be put in operation sometime next month. The machinery is now being installed. The cottages for the operatives have been completed.

—*South Carolina, St. Matthews. Work will soon be started on construction of the St. Matthews Cotton Mill, as nearly all of the necessary stock ($100,000), has been subscribed. W. T. C. Bates is interested in this project.

—*South Carolina, Weinona. The Weinona Cotton Mills, in which Chas. Warren Davis is interested, will have 180 looms in addition to the 5000 spindles for making duck and coarse cotton flannel. The location of the mill will be at a town to be called Munsey.

—*South Carolina, Williamston. The capital stock of the Williamston Cotton Mills was doubled at a recent meeting of the stockholders.

—*Tennessee, Fayetteville. Contracts have been let for the Elk Cotton Mills, of which C. B. Bagley is general manager. The plant, which will have an equipment of 4000 spindles, for making 26s to 36s yarns, will cost about $75,000, and will be ready for operation about November 1st. The mill will be built with a capacity of 8000 spindles, and the remainder to make this number will be put in later.

—*Tennessee, Humboldt. Work has been started on the erection of the Humboldt Cotton Mills, which will have an equipment of 3500 spindles and 100 looms, for making domestics.

—*Texas, Belton. The Belton Cotton Mills, recently incorporated, will start work at once on construction of the buildings, which will be 120x80 feet, 2 stories, with engine and boiler house, 30x40 feet. The present capacity of the plant will be 3,120 spindles. A 210 h. p. engine will be installed, but so arranged so that it can be increased to 400 h. p.

—*Texas, Bonham. Work will be started in a few days on the construction of the Bonham Cotton Mills, plans for which have been received by the directors and accepted. About 40 of the cottages for the operatives have been completed. Further data concerning the mill has been previously reported upon.

—*Texas, Corsicana. The Corsicana Cotton Factory, which has been incorporated with a capital stock of $100,000, with Geo. T. Jester, president, J. W. Edens, treasurer, and J. M. Taylor, vice-president and superintendent, expect to begin operations October 1st, 1900. The mill, which will be equipped with 5000 spindles and 150 looms, will manufacture duck and drill.

—*Texas, Cuero. A recent report states that work will probably be started on construction of the Cuero Cotton Mill,

some time in August. They have already made provisions for power to run the factory for a period of five years with the Buchel Power & Irrigation Co.

—*Texas, West. Work has been started on foundation of the West Cotton Mills, recently incorporated with capital of $100,000. Details of mill have been previously given.

Enlargements and Improvements.

—*Alabama, Huntsville. The machinery is now being installed in the new addition recently completed to the Huntsville Cotton Mill. Operations will be started in a few weeks.

—*Connecticut, Baltic. Work is now being pushed on the addition to the Baltic Mill.

—Connecticut, East Hampton. A new building, 40 by 60 feet, is to be erected by the Starr Bros. Net & Twine Co. The building will be of brick, fireproof, two stories and basement and will be attached to the south side of the present factory. Contract for building has been let to J. H. Jones, of Willimantic.

—Connecticut, Moosup. Extensive improvements are now being made by the Aldrich Manufacturing Co. About 100 additional looms are to be installed and put in operation shortly. They are also building a large addition to the present stock house.

—Connecticut, New Haven. A brick addition is to be built to the New England Warp Company's plant.

—*Connecticut, Jewett City. Extensive repairs are now being made to the Slater Mills at this place.

—*Connecticut, Middletown. The Arawanna Mills have had plans and specifications prepared for a building to be erected, 42 by 70 feet, five stories, brick, to be used as a storehouse.

—Connecticut, Norwich. The Totokett Mills are now having general repairs made to the plant.

—*Connecticut, Willimantic. The new finishing mill of the American Thread Co.'s plant is nearly completed.

—Georgia, Griffin. Application has been made by the Griffin Mills, to increase the capital stock from $250,000 to $500,000.

—Massachusetts, Fall River. Extensive changes are being made in the plant of the Bourne Mills and eventually they will have spinning frames replacing all the mules in the plant. They have recently taken out 3 pairs of mules.

—Massachusetts, Lawrence. The Lawrence Duck Co. contemplates installing a large water wheel in the mill early in September.

—Massachusetts, Lawrence. William & Charles Beck, manufacturers of cotton and electric covering, and linen fire hose, are to move to Hollis Street, from 52 Alder Street, where they now are, on account of their increasing business. They will install two additional looms with accompanying machinery, giving them a total of seven.

—Massachusetts, Methuen. New dye machinery is being installed in the Methuen Co.'s plant.

—Mississippi, Stonewall. The Stonewall Cotton Mills, of which T. L. Wainwright is secretary, are to install a complete electric light plant. About 800 incandescent lamps are to be fitted up.

—*North Carolina, Charlotte. In regard to the additions to the Louise Mills, we learn that they contemplate installing additional carding and spinning machinery, increasing the plant to a capacity of 25,000 spindles and necessary looms, a new weave shed to be constructed for the looms, while the spinning machinery is installed in the present building. It is quite likely, that although the matter is now under consideration, the addition will not be made before next spring. E. A. Smith is president of the concern.

—North Carolina, Cherryville. An addition is now being built to the Gaston Mfg. Co.'s mill, in which they will install about 100 looms when completed.

—North Carolina, Lancaster. The Lancaster Cotton Mills recently increased their capital stock to $1,000,000 and will add 50,000 new spindles to the plant. Orders have been placed for the new machinery.

—North Carolina, Newton. A new and large engine is to be installed in the Catawba Cotton Mill. The mill will be shut down during the installation. They will also install about 1200 new spindles.

—Pennsylvania, Philadelphia. The Arkonia Manufacturing Co., which have recently removed from Fifth St., and Columbia Ave., to Oxford & Hancock Sts., have installed 90 new looms.

—*Rhode Island, Phenix. Work has been started on erection of an addition, 90 by 75 feet, 3 stories high, to the Harris Textile Mill property, recently acquired by the Interlaken Company of Arkwright, R. I. The spinning department is to be removed to the second floor and 350 new looms installed. Among other machinery additions to be made to the plant, will be 11 speeders, a new breaker and picker feeder, 2944 mule spindles, two new boilers and new drawing frames throughout.

—Rhode Island, Woonsocket. An addition, 50x20 feet, one story, is now under construction for the Globe Mill of The Social Manufacturing Co. This will be used as a cloth room, when completed.

—*South Carolina, Clinton. The Clinton Cotton Mills, now operating 16,128 spindles and 450 looms, are installing 3,500 additional spindles in the plant.

—*South Carolina, Greenwood. The new additions for the Greenwood & Grendel Mills are nearly completed. The building for the Grendel Mill is ready for installation of machinery. These mills are to double the capacity of the present plants.

—*South Carolina, Rock Hill. Work has been started on the addition to be made to the Manchester Cotton Mills. They contemplate having the work completed by the first of October.

—*South Carolina, Yorkville. Work has been started on the addition to the main spinning room of the York Cotton Mills.

—*Tennessee, Chattanooga. The Vance Cotton Mills, which have recently installed new machinery in the plant, which will increase the output 50 per cent., are still in the market for some good reels.

Mills Shutting Down.

—Indiana, Evansville. A strike is now prevailing among the operatives of the Evansville Cotton Mills and as a result the plant is now idle.

—Kansas, Independence. The Kansas Cotton Mill Co. has closed its plant indefinitely. Goods have accumulated and until they are sold the plant will remain closed.

—Louisiana, Clinton. The Clinton Cotton Mills have been shut down, owing to scarcity of cotton. It is not known when operations will be resumed.

—Massachusetts, Farnumsville. A recent report states that the Farnumsville Cotton Mills, Harvey & Kempton, proprietors, are closing out stock and that the plant is to be shut down in about two weeks. It is not known whether the shut down is only temporary or permanent.

—*Massachusetts, Lowell. The Tremont & Suffolk Mills, which we previously reported would be shut down, will be closed from August 25th to September 4th.

—Rhode Island, Hope Valley. The print cloth mill operated by Nichols & Langworthy Machine Co., of which Amos G. Nichols is president, has been shut down indefinitely.

—Virginia, Manchester. The United Cotton Mills Company, which is a consolidation of the Marshall Mills and Richmond Cotton Mills, will close the plants August 1st. This is the outcome of an effort by the Manchester Council to enforce the payment of city taxes, from which the company has hitherto been exempt.

Woolen.

New Mills.

—*California, Eureka. The new 4 set woolen mill at this place is known as the Humboldt Bay Woolen Mill. J. W. Henderson is president; William Carson, vice-president, and A. W. Berr will be superintendent. Orders for machinery are now being placed by Messrs. Henderson and Berr, and it is hoped that the plant will be ready to start up in October. They will make a general line of woolen goods, including men's woolen and worsted dress goods, etc. They will have a dyehouse.

—*Iowa, Davenport. The Economy Rug Company, which has been incorporated with capital of $10,000, W. M. Fowler, president, A. H. Fowler, treasurer, and H. C. Briceland, secretary, manufactures rugs from old carpets, having 10 looms in operation. They are in the market for cone winders, paper tubes, heddles and reed and harness.

—*Massachusetts, Byfield. The Byfield Woolen Company, which has recently started work on large addition to the plant, has increased the capital stock to $50,000.

—*Massachusetts, Plymouth. George Mabbett & Sons' new weaving plant is being rapidly gotten under way, and eight looms of the total fourteen are ready to run. The plant will be operated by electricity, with four motors. They will do their own dyeing and finishing, and sell their own goods.

—*New Jersey, Passaic. Operations have been started in the new Gera Mills. A few looms are running, making cloth. The balance of the machinery is being set up as rapidly as possible.

—Ontario, Milton. Machinery is now being installed in a large carpet factory now under construction at this place.

—*Oregon, Portland. The Portland Woolen Mills Co. has been incorporated with capital stock of $90,000 by Fred Carter, William Walker and Raleigh Stott. The concern contemplates erecting a woolen Mill. This probably refers to same project in which we previously reported Charles Coopey interested. Mr. Carter was superintendent of the Tacoma Mill.

—*Rhode Island, Pawtucket. D. A. Everly, who has established a plant for manufacturing cotton warp woolen goods in the old Slater Mill, will install 25 additional looms in the mill. When the new machinery is running, the capacity of the plant will be about doubled.

—*Utah, Ogden. The Ogden Woolen Mills, which were recently purchased by J. A. Hendrickson and others, are now being operated by the Ogden Woolen Mills Company, which has been incorporated with capital of $30,000. J. A. Hendrickson, president; I. L. Clark, treasurer and C. E. Thorstensen, secretary and manager. The mill is now making yarns, linseys, blankets and wool batts.

Enlargements and Improvements.

—*Connecticut, Rockville. Work is progressing on the new addition to the American Mills Co.'s plant, the frame now being up .

—Indiana, Evansville. The Evansville Woolen Mill Company has started work on erection of an addition, 120 by 68 feet, four stories. Cassimeres will be made in the new mill, when completed. The company expects to have the annex running in about three months.

—Massachusetts, Pittsfield. Two new spinning machines are now being set up in the Russell Mfg. Co.'s mill.

—Massachusetts, Holden. An addition has recently been built to the Dawson Mfg. Co.'s mill, in which they have installed one set of carding machinery.

—*Massachusetts, Indian Orchard. The Indian Orchard Company have recently rented one-half of their new mill to the Hodges Fibre Carpet Company, who were in need of more room, owing to increasing business. About 50 new looms have been ordered, which will require an addition of about 100 employees to the present force.

—Massachusetts, Lawrence. The Walworth Bros. Worsted Co. will install 22 new Knowles looms in the plant, giving them a total of 60 when completed. They will also install additional dressing machinery.

—Massachusetts, Lowell. The Belvidere Mill, No. 1, which was closed during the first week in July, installed a new Rodney Hunt four string washer in the wet finishing room.

—Massachusetts, Lowell. The Massachusetts Mohair Plush Company has recently built a two story addition to their plant for a sorting and scouring room. This concern has recently begun the manufacture of novelty yarns.

—*Massachusetts, North Andover. The Osgood Mills, formerly the North Andover Mills, and owned by M. T. Stevens and Sons, are undergoing extensive repairs. The mill is being practically rebuilt.

—*Massachusetts, Oxford. The basement of D. N. Taft's mill is to be equipped for a finishing department. Previous to erection of new addition, the goods have been sent away to be finished.

—Massachusetts, Plymouth. The changes and enlargements at the Standish Mills are now being pushed forward vigorously. It was at first intended to run the plant by electricity, but now the plan has been changed, and it will be run by steam, and a large boiler and engine house is being built.

—*Michigan, Sault Ste Marie. The Soo Woolen Mill is now operating its plant to the fullest capacity. They have recently removed to a new location and made improvements to the building.

—*New Jersey, Freehold. A new building, 175x30 feet, two and one half stories high, with wing for dyeing and drying rooms, will be erected by a company recently formed with capital stock of $10,000, for Geyer & Ray, proprietors of the Freehold Rug Factory. The company contemplated removing to another place owing to the lack of accommodations, but will now remain.

—*New Jersey, Passaic. The Gera Mill Co. will build an extension to their new mill, 150x81 feet.

—*New York, Jamestown. Among the improvements to be made to the Broadhead Worsted Mills, William Broadhead & Sons, is the erection of a building 88 by 64 feet, 4 stories, in which they will install an electric light plant and will have a 1200 h. p. engine and six 250 h. p. boilers and electric generators. New buildings, 140 by 43 feet, 2 stories high, have replaced the old dyehouses. The upper floors of these structures will be used for carding. A new building, 4 stories, 100 by 150 feet, will replace the old No. 1 mill. Another story is to be added to the present weave sheds. An old building, which was recently purchased by the company has been found inadequate for the new machinery, and is being torn down and replaced by new structure, 96 by 59 feet. A large line of new machinery is to be installed in the plant.

—Pennsylvania, Philadelpia. The Oldham Mills are to install a number of additional Crompton & Knowles looms in the plant.

—Pennsylvania, Philadelphia. The Winfield Manufacturing Co., Worth & Gillingham Sts., have recently installed their own finishing machinery.

—Rhode Island, Bristol. The Cranston Worsted Mill is now having a brick addition built to be used as a drying room and a chemical room.

—*Rhode Island, Woonsocket. The contract for erection of new weave shed for the Dunn Worsted Company has been let to Joseph Gilman & Co. It is expected to have the addition completed Sept. 1st.

—Virginia, Bedford City. A new mill is now under construction for the Bedford Mills Co.

Mills Starting Up.

—*Connecticut, Danielson. Operations have been resumed in the Davis & Brown Woolen Mill Co.'s plant, recently damaged by fire.

—*Connecticut, Moosup. Operations have been resumed in the American Woolen Co.'s mills at this place.

—*Illinois, Hanover. Operations have been resmued in the Hanover Woolen Mfg. Co.'s plant.

—*New York, Fulton. It is now reported that the American Woolen Company will have all the looms in the lower mill in operation this week, and that the whole plant will soon be in full working order.

—*New York, Jamestown. Operations have been resumed in the Jamestown Worsted Mills, which were shut down owing to strike.

—*New York, Skaneateles Falls. Operations will be resumed next week in the Ayreshire Woolen Mills, Gavin Morton, proprietor, which have been shut down.

—*Rhode Island, Providence. The Weybosset Mills, of the American Woolen Co., at Olneyville, have resumed operations after a shut down of two weeks.

Mills Shutting Down.

—Connecticut, Stafford. Both the Phoenix and Riverside Mills were shut down July 2nd for a month.

—Massachusetts, Monson. The S. F. Cushman & Sons branch mill has been shut down a short time for repairs.

—New Hampshire, Ashuelot. Both the mills at Ashuelot are practically shut down.

—New York, Seneca Falls. The Seneca Woolen Mills, John P. Chamberlain, proprietor, have been shut down, owing to dullness in the woolen trade.

—Rhode Island, Lafayette. The Rodman Manufacturing Company has shut down its mills for two months. The company, which manufactures doeskins, employs about 500 hands.

—Vermont, Proctorsville. The Proctorsville Mills of Taft, Burbank & Murdock are shut down indefinitely.

Knit.

New Mills.

—Alabama, Athens. C. E. Frost, of the Athens Cotton Mill Co., informs us that he is interested in the project for erection of a small knitting mill here for manufacturing coarse cotton hose and half hose and undershirts.

—Colorado, Colorado Springs. We have been informed by Robert Boucher, 424 Cooper Ave., that he contemplates starting a hosiery and underwear business in a small way, and increasing as business demands.

—Georgia, Atlanta. The Atlanta Knitting Mills have been organized by W. B. Nunnally, S. F. Parrott, S. Elkin, C. E. Currier, J. Carroll Payne, and others, to manufacture underwear. W. B. Nunnally, the general manager of the concern, whose P. O. address is Box 648, is in the market for machinery, etc.

—Kentucky, Paducah. A knitting mill is to be located at this place. Among those interested in the new enterprise are: George C. Wallace, Frank Scott, Robert Phillips, W. A. Davis and S. C. Toof.

—*Kentucky, Paducah. It is now learned that the Alden Knitting Mills, of New Orleans, La., of which A. W. McLellan is president, are to be removed to this place. A new company is to be organized at Paducah, in which A. W. McLellan and W. H. McLellan, will hold the same positions now held with the mills here; i. e., president and manager respectively.

—*North Carolina, Greenville. The Greenville Knitting Mills, which have been incorporated with a capital stock of $10,000, L. R. Moore, president, and L. S. Atkins, treasurer, will have an equipment of ten knitting machines for making men's underwear. They expect to begin operations September 1st, 1900, employing 40 hands. They are still in the market for some of the minor requisites of the mill.

—*North Carolina, Scotland Neck. The knitting mill, which recently commenced operations, and in which E. J. Shields holds an interest, is known as the S. & J. Knitting Mill. Men's half hose are made, the plant having equipment of 25 knitting machines. Goods are sold by the Domestic Hosiery Company.

—*North Carolina, Tarboro. Contract has been let for erection of the new knitting mill at this place. This is the mill in which D. J. M. Baker, W. H. McNair and others were reported interested in some time ago.

—Pennsylvania, Allentown. The Clinton Knitting Company is a new concern recently established at this place, which started operations July 20, making ladies' ribbed waists. J. F. Thompson, the manager and buyer, was formerly with the Allentown Knitting Company. The mill is equipped with 20 knitting machines and 25 sewing machines. The product is sold direct.

—Pennsylvania, Collingdale. E. G. French & Co. have recently started a hosiery mill at this place, with capacity of about 350 dozen per week.

—*Pennsylvania, New Cumberland. The brick work has been started on the New Cumberland Knitting Co.'s mill. This plant, which will be equipped for making hosiery, expects to begin operations about September 1st.

—*Pennsylvania, Reading. The Active Knitting Mills, E. R. Wood, 222 Chestnut St., proprietor, started operations June 15th, making ladies' full seamless, 184 needle, hosiery. The plant, which has an equipment of 24 knitting machines, is run by steam.

—Pennsylvania, Shoemakersville. Wagner & Heckman, who have recently started manufacturing hosiery at this place, have installed five additional machines in the mill.

—Rhode Island, Woonsocket. Sherman T. Stiles has purchased the old Globe Church and will remodel the building to be operated as a knitting mill.

—*Texas, Denison. A new knitting mill to be known as the Gate City Hosiery Mill is to be established here. W. A. Tibbs, J. T. Munson and F. J. Depuy are interested in the concern. The mill will have a capacity of 300 dozen hose per day. Employment will be given to about 50 people. Work will be started on construction just as soon as details are arranged. New machinery will be purchased in addition to some that will be removed here from Atlanta, Ga.

—*Virginia, Newport News. A. H. & W. E. Cobb, whom we reported previously as making investigations at Salisbury, Md., for establishing a branch plant, have now leased the mill of the old Newport News Knitting Mill Company and will install machinery for making a high grade of half hose. Employment will be given to about 50 people at first. It is said that should the business prove a success, they will erect a large new mill.

—Virginia, Richmond. A knitting mill for making high grade cotton socks is contemplated at this place by M. C. Daughtrey. (P. O. Box 58.)

Enlargements and Improvements.

—*Massachusetts, Worcester. Work has been started on removing the plant of the Massasoit Knitting Company, now at Spencer, to this place. They have leased space in the building owned by B. S. Roy, on Southbridge Street. Messrs B. S. and S. B. Roy have purchased Hon. Erastus Jones and Frank A. Drury's interest in the plant.

—*Michigan, Niles. The Lakeside Knitting Company, which has established a branch factory at this place, will increase the capacity of the plant and change all their hand machines to power.

—Mississippi, Meridian. The Meridan Knitting Mills are to install 15 additional machines in the plant.

—*New York, Oneonta. About 24 machines have been received and placed in position at the Gloversville Knitting Co.'s branch mill here. Business is reported to be very good.

—*North Carolina, Scotland Neck. The Lockland Mills, successors to Andrews & Coughenour, are to make additions to the plant which they have recently acquired. The plant is now equipped with 55 knitting machines for making ladies' and misses' ribbed hose. They will install a larger boiler, more knitting machinery, and enlarge the building.

—Pennsylvania, Auburn. Alterations and additions are now being made to W. H. Diefenderfer & Co.'s mill, which has been shut down for a week.

—Pennsylvania, Hamburg. The Gotham Knitting Mills have recently installed four additional knitting machines in the plant.

—*Pennsylvania, Hummelstown. The Hummelstown Hosiery Co. has recently completed installation of 12 new knitting machines in the plant. They contemplate soon starting on building an addition.

—Pennsylvania, Pottsville. A new addition 24 by 28 feet, is now under construction for J. C. Adcock, Bro. & Co. They are also installing a new 80 h. p. boiler in the mill.

—Virginia, Danville. The Danville Knitting Mills are now installing 36 new machines. They expect to have them in operation within two weeks, giving employment to forty extra hands.

Mills Starting Up.

—*Massachusetts, Highlandville. Operations have been resumed in the knitting mill of Moseley & Co. and W. Carter & Co., after a shut down for vacation and repairs.

—*New York, Hudson. John McCauley, who purchased the Groat Knitting Mill, and who was undecided about operating it, started running the mill July 15th.

—*New York, Little Falls. Operations have been resumed in the Victor Knitting Mill, which were shut down a few months ago. All the departments will be running in full in a short time.

—*Pennsylvania , Gordon. Operations will be started this week in the new hosiery mill established by William E. Johnson.

—*Rhode Island, Woonsocket. Operations have been resumed in full in the Glenark Knitting Mill, which has been running slack previous to the two weeks' shut down.

Mills Shutting Down.

—New York, Rockton. The Eagle Knitting Company has been shut down, owing to a strike.

—Pennsylvania, Pottsville. Unger & Leininger have shut down their mill for an indefinite period.

—Pennsylvania, Pottsville. Operations have been suspended in Ginther Bros.' knitting mill for a month. It is not known just when work will be resumed.

—Pennsylvania, Schuylkill Haven. The Eureka Knitting Mill, operated by Shumacher, Keller & Co., Ltd., which has been shut down for the past two weeks, expects to begin operations again in the near future.

Silk.

New Mills.

—*Massachusetts, Milford. The machinery is now being placed in the Magid-Hope Silk Mfg. Co.'s plant. On the first floor of the main building 28 spinning frames are being installed, while on the second reels and twisting machines are being placed in position. On this same floor 6 gassing machines are being made ready for operations. The plant also contains 4 large Garnett and 7 carding machines.

—*Michigan, Belding. Work will soon be started on erection of the new silk mill for Belding Bros., about which we have made previous mention.

—New Jersey, Paterson. The Oriental Silk Company has been incorporated with a capital stock of $350,000. The incorporators are: John I. Wilkie, of New York; W. B. Goodwin, New York; and L. M. Garrison, of Orange, N. J. The company propose beginning business about July 31st, manufacturing and printing textile goods of all descriptions.

—*Pennsylvania, Bradford. The new silk mill, under construction at this place, for Henry Leon, is fast nearing completion. As soon as it is convenient, the machinery will be installed.

—Pennsylvania, Danville. It is now reported that a company is to be organized here with a capital stock of $25,000 to operate another silk mill. It is not known whether or not new buildings will be erected, or that suitable buildings will be leased.

—Pennsylvania, Taylor. A site near the Bellevue Breaker has been purchased by P. A. Loubignac of the Lackawanna Silk Company for Laurier, Son & Co., who have plans ready for some time for building, but had not decided upon a location. Part of the new mill will be a throwing plant.

Enlargements and Improvements.

—Massachusetts, North Andover. The plant of the American Silk Wiping Cloth Mfg. Co., which has been shut down for about two months, as the result of a fire, has resumed operations. They have installed ten new looms in the mill.

—New York, Auburn. The Kidney & Brigden Company, are to remove from their present location on Logan Street, to the old Stevens plant, where they will have larger space.

—Rhode Island, Pawtucket. An addition, 72x48 feet, two stories high, is to be made to the Dempsey Bleachery & Dye Works. This will be used, when completed, for manufacturing boxes for the company.

Mills Shutting Down.

—Connecticut, S. Coventry. The Washburn Silk Mill, operated by A. Washburn & Son, has been closed indefinitely.

Miscellaneous.

New Mills

—*Massachusetts, Millis. We have been informed by the National Flax Fibre Company (Boston office 219 and 220 John Hancock Bldg.), that they will begin operation about September 1st in their plant for making linen crash, napery, and knit linen underwear, with equipment of 5000 spindles and 400 looms. A dye and bleach house is attached to the mill. This company has a capital stock of $5,000,000, with L. H. Schneider, president; G. M. Foster, treasurer; E. W. Walker, agent and John M. Hathaway, superintendent, while Catlin & Co. are the selling agents.

—*New York, Utica. Negotiations have been completed by the Utica Dyeing Company for property upon which to erect a new plant. As soon as the new mill, which will be built on a much larger capacity than the present plant, is completed, the firm will at once remove to the new location.

—*North Carolina, Spray. Work has begun on erection of the building for the American Mill and Warehouse Co., organized some time ago with capital stock of $200,000. A finishing department for finishing cotton goods with all the latest improved machinery will be installed. It is reported that if this is succesful it is quite likely that the whole plant will be equipped as a finishing mill and a bleachery added.

—*Rhode Island, Slatersville. It is now thought that the new bleachery at this place will be operated under name of the Woonsocket Bleaching and Dyeing Company. The management expects to have the plant in partial operation about October or November, giving employment to about 300 hands. James S. Hooper will be treasurer of the new concern.

Enlargements and Improvements.

—*Massachusetts, Webster. The new mill for the Stevens Linen Works, at North Webster, is nearly completed. Employment will be furnished for about 75 people.

—New Jersey, Passaic. A new brick bleach house is to be erected by the Passaic Print Works near their new storehouse.

Fires.

—Maine, Brewer. The building occupied by L. J. Files & Company, proprietors of the Boston Dye House, was totally destroyed by fire. The loss is estimated at $1000, with no insurance.

—New Jersey, Paterson. The Turkish Towel Mill at this place, of which Wm. Holt is proprietor, was badly damaged by fire recently.

—Ohio, Cincinnati. The building at 26 and 28 East Second Street, occupied by Overman & Schrader Cordage Company of Covington, Ky., as warerooms, was damaged by fire to the extent of about $10,000.

—Pennsylvania, Bristol. The hosiery mill at this place, operated by Howard Williams, has been totally destroyed by fire. Partially covered by insurance.

—Pennsylvania, Gettysburg. The Gettysburg Hosiery Mill, Oscar Riley, proprietor, was damaged by fire recently. Loss on the building is estimated at about $400, fully insured, while that on the machinery was adjusted for about $130.

—Pennsylvania, Philadelphia. The woolen mill operated by William Wolstencroft & Sons, at Mullberry and Bridge Sts., Frankford, was seriously damaged by fire, which started in a two-story brick building used for storage purposes. The loss is estimated at about $30,000 and is fully covered by insurance.

—Pennsylvania, Royersford. The Royersford Dye Works, Frank Kupka, proprietor, were destroyed by fire recently, which started in the vitrified brick works. It is thought that all loss is covered by insurance.

—P. E. I., Charlottetown. The Spring Park Woolen Mills were destroyed by fire recently. The loss is estimated at about $30,000; no insurance.

—West Virginia, Salem. The Salem Woolen Mills, H. W. Willis, proprietor, have been totally destroyed by fire.

Failures and Suspensions.

—New Jersey, Paterson. Catholina Lambert has been appointed receiver of the Hamil & Booth Company. The liabilities amount to $300,000, of which $150,000 represent loans and $150,000 due for silk and current expenses, while the assets are estimated at about $400,000. Both mills will be closed down as soon as the warps on the looms are run out.

Facts and Gossip.

—*Alabama, Anniston. Burnett & Bellingrath are contemplating starting a factory for the manufacture of shoe laces. They will do their own dyeing. The project has not assumed definite shape as yet. They are interested in getting information on the subject.

—California, Oakland. Secretary Craigie Sharp of the Board of Trade at this place, is corresponding with a Mr. F. H. Miller, an Eastern carpet manufacturer, relative to establishing a branch plant here. Mr. Miller proposes investigating the California Jute Mills, with a view of utilizing them for the enterprise.

—California, Stockton. The Stockton Jute Mill and Manufacturing Company has been incorporated for purpose of trying to secure the removal of the California Jute Mills Co.'s plant at Oakland, to this place. John Rutherford, is interested in this project. The mill, it is said has been closed for some years owing to inadequate railroad facilities.

—Connecticut, Bridgeport. It is reported that a firm now located at Providence, contemplates establishing a plant for manufacturing woolen at this place. Investigations are now being made. It is said that employment will be furnished for about 100 people.

—*Georgia, Washington. The project of developing the Anthony Shoals by a company recently formed as the Wilkes Cotton Mill has been abandoned. W. T. Johnson, M. A. Pharr and J. S. Crouch have been appointed to solicit subscriptions for purpose of organizing a new company.

—*Georgia, Columbus. The Eagle & Phoenix Mills will run one of the mills day and night, to supply yarn for the weaving repartments, which are rushed with orders. It is rumored that if more new looms are installed that additions will have to be made to the carding and spinning rooms. The company is now troubled with the high water prevailing in that district, thus causing above delay.

—Georgia, Eatonton. Application for a charter has been made by the Quintette Mfg. Co., of this place. This company is probably formed for purpose of operating the old cotton compress, which we reported in a previous issue attempts were being made to utilize for a cotton mill.

—Massachusetts, Agawam. The carding and spinning rooms of the Agawam Woolen Co.'s mill are running two and three nights a week.

—Massachusetts, Clinton. The worsted and axminster yarn manufacturing departments of the Bigelow Carpet Co., will be shut down for several weeks. The weaving departments are rushed with orders.

—Massachusetts, East Blackstone. F. J. Gobeille has purchased the plant of the Lange Spinning & Dyeing Co. and will continue the manufacture of woolen yarns.

—Massachusetts, Fall River. At a recent meeting of the selling committee of the Manufacturers' Association, it was decided to reduce the output of the mills in the agreement by closing the mills for a period of four weeks during time between July 9th and Sept. 17th, at agents' convenience. The mills not included, are the Hargraves, Parker, Bourne, Barnaby, King Philip, Davol, Conanicut, Kerr Thread, Stevens, Fall River Iron Works Co., Globe and Sanford.

—Massachusetts, Highlandville. W. Carter & Co. and Brook and Brett have closed their mills for the summer vacation and will make various repairs to the buildings.

—Massachusetts, Lawrence. Nearly all the mills here either have shut down or will shut down for about two to four weeks. Others are running only part of their machinery; others only part time. Various causes are given, such as overproduction, uncertainty in prices of raw material, disturbances in China, political campaign, etc. Among mills shutting down in July are the Washington, first two weeks, and Arlington, first week, and will probably shut down again later in the summer. The Pacific closes last two weeks in August. The Butler Worsted Mills have been shut down for three weeks. The carding and combing departments of the Prospect Mills are not running. Kunhardt's mill is running full time, and so is the Pemberton. Manufacturers, generally, look for revival of business early in the autumn.

—Massachusetts, Lawrence. The Arlington Mills have not yet shut down, although work in some of the departments is rather slack, and unless there is an improvement in the outlook, it is quite probable that the plant may close for a week or two during the summer.

—Massachusetts, Lowell. It is stated that the Merrimack Woolen Mills are to be sold at public auction August 9th.

—Massachusetts, Pittsfield. It is reported that about 20 looms in the Bel Air Mill have been removed to the former dry house at the Taconic Mill and will be used there.

—*Massachusetts, Plymouth. The Standish Worsted Mills have now been incorporated under the name of the Standish Worsted Co., with B. F. Mellor, president and Frank E. Anderson, treasurer. The capital stock is placed at $240,000.

—Massachusetts, Pittsfield. The Pontoosuc Mill has been shut down for purpose of making repairs.

—Massachusetts, Shirley. H. V. Martin is now receiving estimates on a mill, equipped with ten new or second hand machines for manufacturing hosiery.

—*Massachusetts, Spencer. The Red Mill, which was recently sold to Newton Darling, who purchased in the interest of Mrs. Anna Prouty Darling, was again sold by Auctioneer Charles A. Boyden, and bid in by Frederic S. Pratt, the mortgagee, on account of the terms of the first sale not being complied with.

—Massachusetts, Williamstown. The Boston Finishing Works are now running overtime, till ten o'clock evenings.

—Minnesota, Duluth. E. P. Alexander, of this place, has been corresponding with woolen mill men regarding the establishment of a mill at this place.

—New Hampshire, Laconia. It is rumored that the building formerly occupied by the Waverly Shoe Company will be remodelled by a company who will manufacture knit underwear.

—New Hampshire, Lisbon. The Granite State Electric Works have been incorporated with capital stock of $25,000, for winding wires with silk and cotton. Henry C. Libbey, Henry H. Atwood, Calvin J. Currie, J. W. Richardson and Walter Williams are the incorporators.

—*New Hampshire, Meredith. The American Flax Company now has its fifty looms running in full for the first time since they made the enlargements.

—*New Jersey, Millville. The Millville Mfg. Co. has resumed operations after a stoppage of one week, to allow connecting of the shafting with the new weave shed recently completed.

—New Jersey, Newton. The Sterling Silk Company, with mills at this place and Pittston, Pa., is now known as the Valentine & Bently Silk Company.

—New Jersey, Paterson. Many of the silk mills in Paterson have been shut down, or are running on short time, throwing a great many employees out of work.

—New York, Amsterdam. The Acorn Knitting Mill, formerly operated by the late Willard McElwain, is now under management of Hoel S. McElwain, a nephew of W. McElwain.

—New York, Astoria. The firm of Newwitter & Migel, proprietors of the Gotham Silk Mills, have dissolved partnership and the business will be now conducted by M. C. Migel & Co.

—New York, New York. A company known as Moore & Lucas has recently been incorporated here with capital of $90,000, for manufacturing and selling hosiery and underwear.

—New York Cohoes. The Mohawk River Mill is now manufacturing yarn for other concerns who are unable to secure enough yarn to fill orders.

—New York, Fort Plain. The Favorite Knitting Mills Co. has been incorporated with capital stock of $50,000 with Frank W. Bauder, president; D. I. Devoe, vice-president and general manager and Geo. P. Fellows, secretary and treasurer. This company will operate the plant formerly conducted by D. I. Devoe. Additions will be made to increase the floor space of the work rooms.

—*New York, Gloversville. The Gloversville Felt Co., incorporated with capital stock of $20,000, succeeds the Gloversville Hair Co., with G. Levor, president, J. H. Filmer, treasurer, and John Prendergast, superintendent. It operates 4 sets of cards on shoe sole felt, bicycle, saddle pad, tailors' trimmings, saddlery felt and inner sole felt.

—New York, Gloversville. The Gloversville Felt Company has been incorporated. It was formerly known as the Gloversville Hair Company.

—New York, New York. The A. H. Whitmore Company has been incorporated with capital stock of $10,000 to manufacture art fabrics and textiles. The directors are: Albert H. Whitmore and S. K. Killock, Brooklyn and Samuel Schuhman, New York.

—New York, Athens. The Athens Knitting Co. will increase the capital stock from $40,000 to $45,000.

—New York, Oswego. The plant of the Mohawk Manufacturing Company has been partially shut down, owing to strike prevailing among the spinners.

—New York, Pleasant Valley. The Pleasant Valley Cotton Mill, operated by Garner & Co., has been obliged to shut down part of the time on account of water shortage.

—*New York, Sidney. Joseph H. Clark of Sidney and Counselor Charles S. Nisbett of Amsterdam have been appointed permanent receivers of the Clark Fabric Company.

—New York, Watertown. Charles G. Duffy and A. F. Nellis, of Duffy's Silk Mills, located at Fort Plain and Port Jervis, N. Y., have been in this city considering the project of removing their plants here. They wish to move the plants to some place where a water power can be secured, as one mill is now operated by steam. If suitable site is obtained, they will erect a new building, 75 by 200 feet, three stories high, which will give employment to about 300 hands.

—*North Carolina, High Point. We now learn that the Carolina Mfg. Co., recently reported incorporated with capital stock of $10,000, J. A. Lindsay, president and W. H. Ragan, secretary, will not manufacture cotton goods at first, but will operate a shirt factory.

—North Carolina, Sanford. H. M. Holleman, of 713 Tremont Temple, Boston, informs us that nothing definite has been determined as yet regarding the $100,000 cotton factory reported in a previous issue.

—North Carolina, Scotland Neck. C. L. McDowell, L. M. Pittman and G. T. Andrews have purchased the Andrews & Coughenour Knitting Mill at this place. It will hereafter be known as the "Lockland." The new owners contemplate making improvements to the plant.

—North Carolina, Shelby. It is reported that a cotton mill is to be erected at the Chambers Shoals, Stice's, by H. F. & Jno. F. Schenck, who have recently purchased the same.

—North Carolina, Youngsville. A company is now being formed at this place to build and operate a cotton spinning mill, starting out with a small equipment, less than 5,000 spindles and gradually increasing.

—Ohio, Norwalk. Efforts are now being made at this place to secure the establishment of a large silk manufactury.

—Ohio, Piqua. The Cahill-Leonard Knitting Company has been incorporated here by J. M. Cahill, A. L. Daniels, William K. Leonard, C. E. Leonard and Arthur S. Gray. Capital stock is $30,000.

—*Pennsylvania, Allentown. F. N. Trexler, who was appointed trustee of the bond holders of the West End Silk Mill, sold the property at a public sale, to the bond holders. Because of default in payment of interest on the bonds secured by first mortgage, for $40,000 on the property, the sale took place.

—Pennsylvania, Beavertown. J. T. Strohecker, who has been operating a knitting mill at this place making cotton hosiery and operating 12 machines, informs us that he has discontinued the business.

—Pennsylvania, S. Bethlehem. P. A. Young, of Slatington, has been communicating with Mr. Bachman of this place, in reference to locating a silk ribbon mill here. He desires $5,000 raised in subscriptions, as an inducement.

—*Pennsylvania, Bridgeport. The James Lees and Sons' Company, manufacturers of woolen, worsted and carpet yarns, is rushed with orders and are constantly improving the product by adding new machinery.

—*Pennsylvania, Philadelphia. We have been informed by C. H. Masland & Sons that the damage to their buildings by fire recently, was light, the most damage being caused by water and the machinery escaping injury. The plant is now in full operation.

—Pennsylvania, Phoenixville. The Perseverance Knitting Company and the Davis Company has been consolidated under the Perseverance Co., Ltd.

—*Pennsylvania, York. At a recent meeting of the stockholders of the York Silk Co., Henry Musser was elected president; W. S. Bond, vice-president; Frank Reeser, secretary and treasurer and M. G. Collins, manager.

—Pennsylvania, South Cumberland. The Klots Throwing Co., of Carbondale, has been offered a free site to erect a mill at this place.

—*South Carolina, Clifton. The Clifton Mill No. 2 will turn half its product back to four yard goods. The coarser grade which was exported to the Chinese market now has no outlet.

—South Carolina, Clio. The Red Bluff Cotton Mills have been sold for $17,005. The plant will be reorganized and put in operation at once.

—South Carolina, Orangeburg. A project is now afoot for the erection of a knitting mill at this place.

—*South Carolina, Rock Hill. The Manchester Cotton Mills, which we previously reported making additions, have increased the capital stock of the plant to $250,000.

—South Carolina, White Rock. It is reported that a water power on the Saluda River has been purchased by a syndicate, who contemplate erecting a cotton mill, although nothing definite has yet been made public.

—South Carolina, Winnsboro. The capital stock of the Fairfield Cotton Mills has been increased from $102,000 to $200,000.

—Texas, Pittsburg. W. C. Hargroves and D. H. Abernathy are interested in the erection of a cotton mill at this place.

—*Texas, Temple. We have been informed by Jas. H. Miller that he has been considering a grass rope and a binding twine mill, but not a cotton rope plant as reported by us. A company has been formed known as the Gillett Commission Co., and they are now looking up machinery, etc., required to operate such a plant.

—Utah, Ogden. The Ogden Woolen Mills have been incorporated with capital stock of $30,000 with J. A. Hendrickson, president; Joseph F. Smith, vice-president and C. W. Cross, secretary and treasurer. This company will operate the Ogden Woolen factory, which they recently purchased. Improvements and additions are being made to the machinery. Yarns, blankets, etc., will be manufactured.

—Virginia, Roanoke. A company has been organized for purpose of establishing a silk factory at this place. A location has been granted the concern by the City Council, with the stipulation that employment be given to at least fifty people.

PERSONAL RECORD.

Cotton.

—John H. Anderson, formerly with the Bibb Mfg. Co., Macon, Ga., has become superintendent of the Covington Cotton Mill, Covington, Ga.

—Thomas Brindle, overseer of weaving, has severed his connection with the Hope Webbing Co., Pawtucket, R. I., to take a position as superintendent of weaving at the Hamilton Webbing Co., Wickford, R. I., made vacant by the death of George Steere.

—J. H. Bullock, late overseer of the weaving, slashing, drawing in and cloth departments of the Eagleville Mill, Eagleville, Conn., is now in a similar position with Wm. Parks & Son, St. John, N. B.

—J. W. Bennett, late overseer of the Batesburg, S. C., mill, has been made assistant superintendent of the Sycamore, Ala., mills.

—T. L. Clark, superintendent of the Mammoth Springs Cotton Mills, Mammoth Springs, Ark., changes this month to the Moorehead Cotton Mills, Moorehead, Miss.

—A. W. Chapin, superintendent of the Powhatan Mfg. Co., Norfolk, Va., has resigned his position.

—A. M. Davis, boss carder at the Skenandoa Mills, Utica, N. Y., has resigned to become overseer of carding at the Gloucester Cotton Mills, Gloucester City, N. J.

—J. T. Emery, second-hand of carding at the Pepperell Mills, Biddeford, Me., has been appointed overseer of that room, succeeding the late G. W. Libby.

—John D. Eddy, overseer of carding at the Iron Works Mill No. 2, Fall River, Mass., has accepted the superintendency and management of the Chadwick Mills, Chadwick, N. Y.

—T. Fairchild, late overseer of carding and spinning at the Odell Mills, Bynum, N. C., has assumed his new duties as superintendent of the Smithermah Mill, Troy, N. C.

—H. N. Fish, for 18 years an overseer in the Palmer Mills, Three Rivers, Mass., has taken charge of the picking, carding and spinning in the new No. 6 mill of the Nashua Mfg. Co., at Nashua, N. H. The employees of the Palmer Mills presented Mr. Fish with a handsome gold watch when he resigned.

—John W. Gilston, New Bedford, Mass., has recently assumed the superintendency of the West Point Cotton Co., West Point, Miss.

—T. C. Haskell has accepted the overseership of the carding and spinning departments at night at the Monroe Cotton Mills, Monroe, Ga.

—J. C. Lewis has recently accepted the superintendency of the Vesta Cotton Mill, Charleston, S. C.

—Harry Gaunt has resigned as overseer of corduroy cutting at the Eagle Mills, Woonsocket, R. I., to accept a similar position in Allentown, Pa.

—W. N. Kimball, for the past fourteen years superintendent of the Great Falls Mfg. Co., Somersworth, N. H., on July 28th left for Woonsocket, R. I., to become general superintendent of the Social and Nourse Mills of the Social Mfg. Co. He succeeds Charles H. Merriman, Jr., who goes to Providence to act as assistant to Henry F. Lippitt, the agent, and to his father, C. H. Merriman, the treasurer. Mr. Kimball was presented with a beautiful cut glass punch bowl by Treasurer Nichols of the Great Falls Mfg. Co., and the heads of the departments. The treasurer complimented him on his efficiency during his years of service in the employ of the company. He regretted his leaving, and prophesied his success in his new position.

—J. R. Killian, at present superintendent of the Alpha Mill, Charlotte, N. C., has engaged with the Laboratory Mills at Lincolnton, N. C., to take charge as superintendent. Isaac Edwards, who has had charge of the Alpha Mill at night, has been appointed to take Mr. Killian's place.

—Robert A. G. Mackenzie, overseer in the No. 1 City Mill, New Bedford, Mass., has been promoted to the position of overseer of spooling, warping and twisting in the No. 2 City Mill, in consequence of Mr. Gilston, the former overseer, having accepted a position as superintendent of a mill in West Point, Miss. Mr. Mackenzie is one of the evening instructors in the New Bedford Textile School.

—B. F. Nuttall, formerly overseer of carding and spinning at the Rodman & Heath Mill at Waxhaw, N. C., is now at the Springstein Mill, Chester, S. C.

—B. S. Patton, late of the Southwark Mills, Philadelphia, Pa., has accepted the superintendency of the Glasgow Mills in that city.

—A. Platt has secured the position of overseer of carding department of the New York Mills, N. Y.

—Patrick Quigley, recently secondhand in the weaving department at the Albion Mills, Central Falls, R. I., is now overseer of that department.

—R. J. Redd, late of Augusta, Ga., mills, is the new overseer of carding at the Langley, S. C., mills.

—Charles Rowe, who has been appointed superintendent of the Great Falls Bleachery, Somersworth, N. H., has assumed his new duties. He is from North Adams, Mass., where he has been in the employment of the Arnold Print Works. Previous to that he was employed at the Bondsville Bleachery, Bondsville, Mass.

—W. H. Smith, overseer of spinning at the Manetta Cotton Mills, Lando, S. C., has resigned.

—W. F. Sherman, civil and mechanical engineer of Boston, is at present in England, where he will remain for a few months on an important mission involving large business interests of many of the greatest and best manufacturing industries in that country.

—C. H. Styke is now boss spinner at the Harmony Mills, Cohoes, N. Y.

—R. L. Walker, late superintendent of the Laurens, S. C., mills, has taken charge as superintendent of the Enoree, S. C., mill. A. Wright, who succeeds Mr. Walker at Laurens, S. C., has assumed his new duties.

—L. Whitney is overseer of weaving in the new No. 5 mill of the Nashua Mfg. Co., Nashua, N. H. Mr. Whitney resigned a similar position with the Albion Co. at Central Falls, R. I., after holding it with marked success for 12 years. He was presented on leaving with a finely carved meerschaum pipe by his friends in the mill.

—Arthur L. Ware has succeeded Walter McGregor as superintendent of the Laurel Mills Mfg. Co., Roswell, Ga. Mr. McGregor goes to the Eagle & Phoenix Mills, Columbus, Ga.

Woolen.

—Geo. W. Burr, recently overseer of finishing in the American Woolen Co.'s mill, Dover, Me., has engaged in a similar capacity at North Chelmsford, Mass.

—Frank W. Besser, of Bridgeton, R. I., has recently accepted the position of boss weaver in the mill of the Kent Mfg. Co., Centreville, R. I.

—A. T. Bright is superintendent of the South Chester Mfg. Co., Chester, Pa.

—Henry R. Cushing has completed his duties as superintendent of the Endrick Woolen Mills, Great Barrington, Mass., and has gone to Wallingford, Pa., to take charge of a mill there.

—R. H. Church, superintendent of the Wickford Worsted Mills, Wickford, R. I., has gone to Raritan, N. J.

—A. Courtenay, who for the past seven years has been boss burler at the Assabet Mfg. Co., Maynard, Mass., has resigned.

—F. E. Cane, boss weaver, has severed his connection with the American Woolen Co., Moosup, Conn.

—Robert Crossley is now boss dyer for the Yantic Woolen Co., Yantic, Conn.

—James J. Donalan, for more than twenty years employed in the carding department as overseer or assistant at William Wood & Co.'s woolen mills, Philadelphia, Pa., has accepted a similar position in the 17-set woolen mill at Oella, Md., operated by W. J. Dickey & Sons. He succeeds C. H. Dorsey.

—R. Denniston has secured the position of overseer of the dressing department of the mills of the Assabet Mfg. Co., Maynard, Mass.

—Howard Dudley, for some time boss dyer at the Dingley Mfg. Co., Philadelphia, Pa., has resigned in order to accept a similar position with the Quaker City Dye Works, Philadelphia.

—James Donaldson, of Ware, Mass., is now boss finisher for the Dews Woolen Co., North Dexter, Me.

—Thomas H. Dunlevy, formerly employed at the Pranker Mfg. Co.'s mill, Saugus, Mass., has been selected as superintendent of the Northern Ohio Blanket Mills, Cleveland, Ohio.

—Thomas Donalon is superintendent in the Collins & Levey Woolen Mill at Gilsum, N. H.

—F. E. Devereaux of Stafford Springs, Vt., is boss dyer at Harrisville, N. H.

—John Eastwood has resigned as boss finisher at Monson, Mass., and returned to his home in Winooski, Vt.

—Octave Gilbert is now boss carder for the Crosby Mfg. Co., East Glastonbury, Conn.

—Herbert Greenhalge, secondhand in the finishing department of the Lippitt Woolen Co., Woonsocket, R. I., has accepted a position with the Hampden (Mass.) Mills as boss finisher.

—G. W. Gerry, late overseer of mule spinning at the Winooski Woolen Mill, Winooski, Vt., is now at Montmorency Falls, P. Q., in charge of all the spinning for the Montmorency Cotton Co.

—John Ginty is now night overseer of spinning at the Sarnac Worsted Mills, Blackstone, Mass.

—James Gallagher, boss finisher for the Endrick Woolen Mills, Great Barrington, Mass., has resigned.

—J. W. Greenwood, boss carder and comber at the Chautauqua Worsted Mills, Jamestown, N. Y., has accepted a similar position with the Manhattan Worsted Mills, New York City.

—Joseph Glennon, boss fuller at the Collins Mills, Collinsville, Mass., resigned recently.

—John Heard has been succeeded by William Rehartzky as boss carder at William Emsley Bros.' mill, Philadelphia, Pa

—John Howard, overseer of weaving at the Belvidere Mill No. 1, Lowell, Mass., has been promoted to Belvidere Mill No. 2, to take the place of Charles N. Bagley. Gus Lawles, secondhand of Belvidere No. 1, is now overseer of the weaving department.

—George W. Hall has severed his connection with the Brookville Woolen Mills, Jefferson County, Pa.

—W. S. Hills, designer and assistant superintendent for a number of years with the Talbot Mills, North Billerica, Mass., has severed his connection with that concern, and Albert W. Slocum, boss weaver of the mills, has succeeded him.

—O. F. Ireland, who, since its organization, has been manager of the Penobscot Woolen Co., Dexter, Me., has retired and sold a part of the stock, of which he was a large owner.

—Henry Ingham has resigned his position at the Chautauqua Worsted Mills, Jamestown, N. Y., to become overseer of the worsted yarn department at the Clinton Worsted Mill, Clinton, Mass.

—Horace A. Kimball, founder of the Manton Mills, Manton, R. I., has resigned as manager of the concern, and Frank E. Weeden, for a number of years superintendent of the Weybosset Mills, Providence, R. I., will be his successor.

—James Knox of Providence, R. I., has recently accepted the position of overseer of dyeing at the Springvale Woolen Mills, Springvale, Me.

—James R. Kelley, for a number of years loom fixer in the Dudley Woolen Mill, Webster, Mass., has accepted a position with the New London (Conn.) Steam Woolen Co.

—John Kavanaugh, of Hope Valley, R. I., has recently become overseer of carding and spinning at the Wickford Worsted Mills, Wickford, R. I.

—Edward Lannigan has severed his connection with Joseph Randall & Bros., Germantown, Philadelphia, to become boss spinner at A. Platt & Son's cotton, wool and yarn mill, Manayunk, Philadelphia.

—Benjamin D. Mellor, who filled the office of superintendent of the New England Woolen Mill in Rockville, Conn., is to be president and manager of the Standish Woolen Co., Plymouth, Mass.

—R. K. Manter, formerly of Blackinton, Mass., has secured the position of boss dyer at the Winooski Worsted Mill, Winooski, Vt.

—Charles A. Platt, of Beaver Dam, Wis., has engaged as superintendent with the Rochester Woolen Mills, Rochester, Minn.

—Godfrey Mann, of Camden, Me., has engaged as boss carder for the Penobscot Woolen Co., Dexter, Me.

—L. Murphy, formerly of the Washington Mills, Lawrence, Mass., is now one of the boss spinners of the worsted department of Edward T. Steele & Co., Bristol, Pa.

—Robert McArthur, overseer of weaving at the Merrimack Woolen Mills, Dracut, Mass., has removed to Lebanon, N. H., to accept a position in a woolen mill.

—A. Manning has been promoted from secondhand to boss carder in the Auburn Woolen Co.'s mills, Auburn, N. Y.

—Frank Nasch, overseer of carding for the Bridgeton (N. J.) Woolen Co., has resigned in order to return to his former position in charge of the carding department of the Oakland Mfg. Co., Haight, Carroll Co., Md.

—Thomas Pierce, of Worcester, Mass., has been engaged as boss carder for the Capron Yarn Mill, Uxbridge, Mass.

—James Ruie, superintendent, has severed his connection with the J. L. & T. D. Peck Mfg. Co., at Pittsfield, Mass.

—Joseph Raconsley has accepted the position of boss weaver of the Ontario Mills, Philadelphia, Pa.

—William J. Rollinson has accepted the position of boss finisher for Simson & Kirkaldy, Woonsocket, R. I.

—Thomas Richmond of Leominster, Mass., formerly overseer of carding for the Summit Woolen Co., Stafford Springs, Conn., is now in the employ of the Dayville Woolen Co., Killingly, Conn.

—R. Sheridan has succeeded H. R. Cushman as boss carder at the Endrick Woolen Mills, Great Barrington, Mass.

—Elwood Smith has succeeded Herman Haigh as overseer of the wool carding department in Folwell Bros. & Co.'s mills, Philadelphia, Pa. Mr. Smith was formerly employed in a similar capacity at Clifton Heights, Pa., by the Caledonia Mills.

—W. L. Shaw has succeeded L. A. Anderson as superintendent of the Anderson Mills, Skowhegan, Me.

—Peter Sheehan is now overseer of dressing and spooling at the Oneko Woolen Mills, New Bedford, Mass.

—James Shaughnessey has severed his connection with Holden, Leonard & Co., Bennington, Vt., where he was employed as foreman of the dyeing room.

—Alexander Smith, of Westerly, R. I., has secured the position of boss weaver and designer for the Montville Woolen Co., Montville, Conn.

—Israel Stead, of Philadelphia, Pa., is now boss carder for the Passaic Woolen Co., Passaic, N. J.

—John Scannell, formerly fixer at the Marland Mill, Andover, and at Saxton's River, has succeeded E. P. Barber, who has resigned as boss weaver at Saxton's River, Vt., and accepted a position at Dover, Me.

—Abraham Taylor has charge of the mule spinning for the Burlington Woolen Co., Burlington, Vt.

—David Wilson has recently accepted the position of overseer of fulling for S. F. Cushman & Sons, Monson, Mass.

—James Williams has resigned as overseer of carding at East Glastonbury, Conn., to accept a similar position in the Baltic Mills of the American Woolen Co., Enfield, N. H.

Knit.

—Robert Boyle, overseer of carding for the Valentine Knitting Co., Bennington, Vt., resigned recently.

—William Gilbert has accepted the position of overseer of the knitting department at the Chester Knitting Co.'s mills, Spring City, Pa.

—George M. Hewitt, Centreville, Mich., has recently engaged with the Alpine Knitting Co., Pittston, Pa., as superintendent.

—William Howard, who for eight years past has been foreman of the finishing room in the Ipswich Mill, Ipswich, Mass., has been promoted to be night superintendent, Harry Crosby succeeding him as foreman.

—H. P. King, formerly foreman of the Plainville Mfg. Co.'s mills, Plainville, Conn., has accepted a position with the Springfield Knitting Co., Springfield, Mass.

—A. E. Lambert of Hoboken, N. J., who recently accepted the position of boss finisher with Fuld & Hatch, Albany, N. Y., entered upon his new duties the 15th of July.

—Charles Tuttle, overseer of dyeing, has resigned his position with the Shaw Knitting Co. at Lowell, Mass., to accept a similar place with the Hooper Knitting Co. T. Borg of the Massachusetts Bleach & Dye Works, North Andover, Mass., has succeeded him.

—W. H. Watters has recently engaged as boss knitter with the Windemere Knitting Mills, Albemarle, N. C.

Miscellaneous.

—Herman A. Metz, president of Victor Koechl & Co., New York, returned last month on the new steamer Deutschland from a two months' vacation in Europe.

—Franklin Allen, secretary of the Silk Association, returned home on August 4th. He has been acting as a member of the jury on rewards at the Paris Exposition.

—George Bannigan, formerly of Paterson, N. J., is now superintendent of the Kidney & Bridgen Co., silk manufacturers, Auburn, N. Y.

Deaths.

—Edward A. Greene, president and treasurer of the Greene & Daniels Mfg. Co. of Central Falls, R. I., died Sunday, July 8, in Philadelphia, of nervous prostration. His death was a shock to his many friends in both business and social circles, and his demise will be keenly felt. He was born in Central Falls, Feb. 9, 1845. He started in as clerk in the office of Greene & Daniels, his father, the late Benjamin F. Greene, being the senior partner. He remained in the office four years, and then went to Europe to study cotton mill methods and machinery. Upon his return he entered the factory and worked four years to acquire a practical training. Mr. Greene's father's partner, Mr. Daniels, died in 1876, and the firm was then incorporated as the Greene & Daniels Mfg. Co., the younger Mr. Greene being elected treasurer. Upon the death of his father, in 1886, Mr. Greene became president of the corporation and in 1895, when Treasurer George Grant resigned, he succeeded him. He was also a director of the Slater Trust Co., the Kent-Stanley Co., Atlantic Mutual Fire Insurance Co. of Providence, Pawtucket Mutual Fire Insurance Co., River Spinning Co. of Woonsocket and a trustee of the Franklin Savings Bank, Pawtucket. His widow and three children survive him.

—Thomas Kitson, a widely known woolen manufacturer and owner of the Stroudsburg Woolen Mills, Stroudsburg, Pa., whose reputation extended to the old world, died suddenly July 5th on a railroad train en route to New York. The cause of his death was heart failure. Mr. Kitson gained fame for a feat which gave to the world a record of speed and workmanship in the textile industry. In six hours and four minutes the fleece of six sheep was transformed into a finished suit of up-to-date clothing worn by Mr. Kitson. The previous world's record of this kind was held by a mill at Galashiels, Scotland, and was eight hours. At the Scotland trial, however, only one kind of wool was used, whereas in the Kitson trial, there was a mixture of 20 per cent. white and 40 per cent. black, making altogether a better cloth and giving a distinct plaid pattern. All in all, the cloth was subjected to 18 processes of manufacture before reaching the tailors, who, in the short time of two and one half hours, had the finished suit, with every button in its place, and fit, style and workmanship of the highest order, at the residence of Mr. Kitson.

—Charles Justin McKenzie, a retired manufacturer, one of the leading men of Franklin, Mass., died suddenly of heart failure at his home in that town recently, in his fifty-fourth year. The deceased was born in Woodstock, Vt., his father being Justin McKenzie, a successful woolen manufacturer and proprietor of the Dewey Mills at Queechy, Vt., in the conduct of which the son had an interest. After graduating from Tufts' College with high honors, Mr. McKenzie associated himself with Hon. Joseph G. Ray of Franklin and Hon. Oscar J. Rathbun of Woonsocket, R. I., in the manufacture of feltings, with factories at Nason's Crossing at Franklin. He retired after a successful career of 12 years. He took a lively interest in the affairs of his town, and his loss to the community will be great.

—Theodore Edwin Isaacks, one of the old merchants of New York, who had been in the wholesale silk business there from 1840 to 1880, died recently. He was born in New York City in 1816, and had lived in Brooklyn for seventeen years since his retirement from active business. He leaves four daughters and one son.

—Jeremiah Dubois, mayor of Bridgeton, N. J., from 1885 to 1894, died last month. For several years he had been in failing health. Mr. Dubois, with his brother, the late Robert Dubois, built the present Eastlake Woolen Mills in Philadelphia, and for many years operated them very successfully. He was afterward connected with a Philadelphia cloth house.

—James Stirk, proprietor of the woolen mill at Sherman, Pa., died suddenly June 29th. Death was attributed to heart failure.

—John M. Dean, a former cotton manufacturer of Rhode Island, died at Carver, Mass., July 8th, aged 77 years.

—Henry Morton, for twenty-five years overseer in the spinning room at the Chase Woolen Mills, Webster, Mass., died last month, in his seventy-second year.

—Sydney Campbell, a well-known young resident of Lansingburgh, N. Y., and a son of George Campbell, the knitting machine manufacturer, of Cohoes, died last month at his home in Lansingburgh. Mr. Campbell was vice-president of the Atlantic Knitting Co., Cohoes, and leaves a widow and one child.

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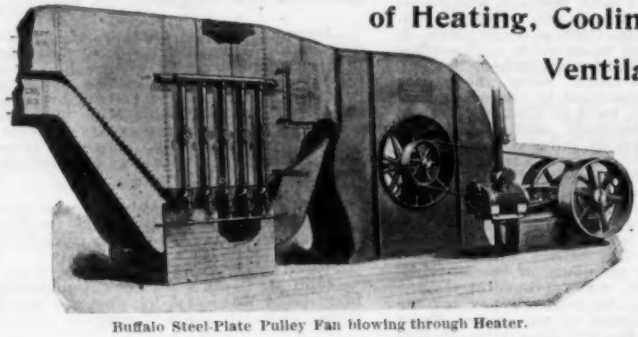

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The one adequate System for heating and ventilating large mills, factories and other industrial buildings, by an unfailing supply of properly tempered air.

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BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.

Appraisals.
American Appraisal Co, Milwaukee, and 804 Park Row Bldg, New York.

Arc Lamps.
Lea Manufacturing Co., Elwood, Indiana.

Architects and Mill Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W., Paterson, N. J.
Tower & Wallace, Broadway and 25th St., New York, N. Y.

Artificial Stone.
Warren Bros. Co., 143 Federal St., Boston.

Asphalting & Asphalt Materials.
Warren Bros. Co , 143 Federal St., Boston.

Asphalt Roofing.
Warren Bros. Co. 143 Federal St., Boston.

Automatic Feeds for Cotton and Wool.
Atlas Foundry & Mch. Co., Newark, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Belt Cover.
Warren Mfg. Co., Chicago, Ill.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Boston Belting Co., Boston, Mass.
Hammer, C. H. & Co., Philadelphia.
Jeffrey Manufacturing Co., Columbus, Ohio.
Link Belt Machinery Co., Chicago, Ill.
Popham, Henry, & Son, Newark, New Jersey.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Co., 168 Virginia St., Buffalo, N. Y.
Stephenson Mfg, Co., Albany, N. Y.
Warren Mfg. Co., Chicago, Ill.

Belt Hooks.
Bristols Co., Waterbury, Ct.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Bosson & Lane, Boston.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Blowers.
American Blower Co., Detroit, Mich.
Buffalo Forge Co., Buffalo, N. Y.
New York Blower Co., New York.
Sturtevant, B. F. Co., Boston, Mass.

Bobbins, Spools, Shuttles, Etc.
Murray, C. O., Nashua, N. H
Parker, Henry Co, Springfield, Vt.
Tebbets, E. L., & Co., Locke's Mill, Me.

Boiler Compounds.
Straus & Co., 50 Broad St., New York.

Boiler Tube Cleaners.
Coggeshall Mfg. Co., 130 1-2 Liberty St., New York.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Braiding Machinery.
New England Butt Co., Providence, R. I.
Thun & Janssen, Reading, Pa.

Braids.
See Tapes, Braids and Edgings.

Brass (Perforated.)
See under Perforated Metal.

Bridges.
American Bridge Co., The, New York.

Brushes.
Felton, S. A. & Son Co., Manchester, N. H.

Brushers.
See Napping Machines.

Buildings (Steel).
American Bridge Co., The, New York.

Burr Pickers.
Atlas Foundry & Mch. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Calico Printers' Machinery and Supplies.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W., Sons & Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.
Taunton-New Bedford Copper Co., New Bedford, Mass.
Rusden Machine Co., Warren, R. I.
See also Dyeing, Bleaching Machinery, etc.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Booth, Benj. & Co., Philadelphia.
Buck Card Clothing Co., Palmer, Mass.
Hammer, C. H. & Co., Philadelphia.
Leigh, Evan A, 35 Mason Building, Boston.

Card Grinding Machinery.
Hardy Machine Co., Biddeford, Me.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Cement "Dealers."
Warren Bros. Co., 143 Federal St., Boston.

Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Clutches.
American Tool & Machine Co., Boston, Mass.
Eastern Machinery Co., The, New Haven, Conn.
Hunter, James, Machine Co., North Adams, Mass.

WHERE? HOW? WHY? WHO?

Where can we get such a machine?

How can we produce that effect, or color, or fabric?

Why does this machine run badly, and what can I do to fix it?

Who makes such and such fabrics?

• • • •

Such questions and scores of similar ones are constantly arising, and our Questions and Answers Department undertakes to answer those relating to textile matters, free of any charge, to the best of its ability, and invites such correspondence from subscribers. Address the Boston office.

TEXTILE WORLD,
620 Atlantic Avenue, Boston.

Combs (Wool and Cotton)
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants (Dry Goods, Knit Goods).
Hirschman, H. 419 Broome St., New York.

Concrete.
Warren Bros. Co., 143 Federal St., Boston.

Conveying Machinery and Chains
Jeffrey Manufacturing Co., Columbus, O.
Link Belt Machines Co., Chicago, Ill.

Copper (Perforated.)
See under Perforated Metal.

Copper Print Rollers.
Phillips Co, The Thomas, Providence, R. I.
Taunton-New Bedford Copper Co, New Bedford, Mass.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.

Corrugated Iron Shutters.
American Bridge Co., New York.

Cotton (Egyptian).
Stoddard, Haserick, Richards & Co., Boston.

Cotton Elevators.
Buffalo Forge Co., Buffalo, N. Y.
Link Belt Machines Co., Chicago Ill.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Philadelphia, Pa.
Ashworth, Elijah, Fall River, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G & Co., Boston, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Schofield, Geo. L., Philadelphia.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Cotton Openers and Lappers.
Howard & Bullough American Machine Co, Pawtucket, R. I.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Decoration Wash for Interiors.
De Ronde, F. S, Co., 54 John St., New York.
Moore, Benj. & Co., Brooklyn, N. Y.

Dextrine.
Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H.W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Kenyon, D. R. & Son., Raritan, N. J.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.

Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dyers, Bleachers and Finishers
American Yarn Printing Works, 134-150 North 22d St., Philadelphia.
Brophy's, T, Sons, Jasper St, Philadelphia
Capstick, John & Sons, Montville, N. J.
Conoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Davidson & Brooke, 2560 No. 3d St., Philadelphia.
Duncan & Baillie, Cohoes, N. Y.
Firth & Foster Co, Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Littlewood. G. J., & Sons, Manayunk, Pa.
Lorimers, The Wm. H. & Sons Co., Phila.
Moit Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Philadelphia Linen Finishing Co., Frankfort, Philadelphia.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W, & Sons Co Phila Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, Machine Works, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Knapp, C. H., Paterson, N. J.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co., Springfield, Vt.
Peel, Samuel H. Germantown, Philadelphia Pa.
Phenix Iron Foundry, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Webendorfer & Walling, Paterson, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dyehouse Floors.
Warren Bros., 143 Federal St., Boston.

Dye Sticks,
Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M., Philadelphia, Pa.

Dyestuffs and Chemicals.
American Aniline Co., 163 No. Front St., Philadelphia.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston.
Dillon & Co, 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Innis & Co, 3 Cedar St, New York.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y
Johnson, Wm. G, & Co, Uncasville, Conn.
Jones, J. Howell, 18 Burling Slip, New York.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.
Matheson, W. J, & Co, 182-184 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
Moit Bros., Millbury, Mass. (Indigo Blue.)
N. Y. & Boston Dyewood Co, 53 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Schoellkopf, Hartford & Hanna Co., Philadelphia.
Sharpless Dye Wood Ext. Co, The Bourse, Phila, Pa.
Stamford Mfg. Co, 123-127 Front St., N. Y.
Sykes & Street, 85 Water St, N. Y.
Thayer, Ed. M., 106 Broad St., Boston, Mass.

Dynamos.
Sturtevant, Co., B. F. Boston.

Edgings.
See Tapes, Braids and Edgings.

Elastic Web Calendering Machines.
Knapp, C. H., Paterson, N. J.

Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Eastern Machinery Co, The, New Haven, Conn.
Jeffrey Manufacturing Co., Columbus, O.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Humphrey, S. K., 53 State St., Boston.

Electrical Construction.
Philadelphia Electric Construction Co., Philadelphia.

Electric Fans.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Electric Motors.
Sturtevant Co., B. F., Boston.

Engine Foundations.
Warren Bros. Co., 143 Federal St., Boston.

Engineers, Mechanical.
American Bridge Co., The, New York.
Ferguson, John W. Paterson, N. J.
Rittenhouse, Frank, Norristown, Pa.

Exhaust Heads.
Burt Manufacturing Co, Akron, Ohio.

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Heaters.
Pendleton, Walter & Co., New York.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fireproof Construction.
American Bridge Co., The, New York.

Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N. Y
Thurston, A. G, & Son, Box 528, Fall River Mass.

Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co, B. F., Boston.

Friction Clutches.
See Clutches.

Friction Hoisting Drums.
Eastern Machinery Co., New Haven, Conn.

Fulling Mills for Woolen Goods.
Hopkins, Machine Works, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Exhausters.
Sturtevant Co., B F., Boston.

Gear Cutting Machine.
Whiton, The D. E, Co, New London, Conn.

Generating Sets.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F, Boston.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hoisting Machinery.
The Eastern Machinery Co.. New Haven, Conn.

Hose.
Boston Belting Co., Boston.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Humidifying Apparatus.
American Air Moistening Co., Boston.

Hydro Extractors.
American Tool & Machine Co , Boston.
Rusden Machine Co., Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Knit Goods Edgings, Trimmings, etc.
Cathcart, John & Co., 115 Franklin St., New York.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Fleming & Chapin, Philadelphia.
Hepner & Horwitz, Lacings, 60 Howard St, N. Y.
Kavanaugh, Geo. W., Cohoes, N. Y.
Krout & Fite Mfg. Co, Allegheny Ave. and Emerald St., Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.

Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
American Knitting Machine Co., Woonsocket, R. I.
Beattie, Wm. & Son, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Leighton Machine Co, Manchester, N. H.
Lindley, Geo. W., 5122 Wakefield St., Germantown, Pa.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co. Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T. New Brunswick, N. J.
Kavanaugh, Geo. W., Cohoes, N. Y.
Lydall, H, & Foulds, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 528 Arch St. Phila, Pa

Looms.
Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1788 Barker St, Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Lubricators.
Ameledema Oilless Bearing Co., Berkeley St , Wayne Junction, Philadelphia.
Dixon, Jos., Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia.

Machinists' Tools.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Manufacturers' Agent.
Cunningham, Jas. D, 1001 Chestnut St, Philadelphia, Pa.

Mechanical Draft.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 544 Hermon St, Worcester Mass.

Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Rusden Machine Co., Warren, R. I.

Mill Brushes.
See Brushes.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Dixon Lubricating Saddle Co., Bristol, R.I.
Easton-Burnham Co., Pawtucket, R. I.
Holmesburg Banding Mfg. Co., Holmesburg, Pa.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.

Noils (Silk.)
Ryle, Wm. & Co., 34 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

umbering Machine.
Bates Machine Co., 346 Broadway, New York.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.

Packing.
Boston Belting Co , Boston.
Jenkins Bros., New York.

Paint.
DeRonde, F. S. Co, 54 John St., New York City.
Moore, Benj. & Co, Brooklyn, N. Y.

Painting and Whitewashing Machine
Triumph Machine & Manufacturing Co. 209 Hester St , New York, N. Y.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Siggers, E. G., Washington D. C.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Pavers & Paving Materials.
Warren Bros. Co., 143 Federal St., Boston.

Perforated Metal.
Beckley, A. J. & Co., Garwood, N. J.
Fraser & Chalmer, Chicago, Ill.
Harrington & King Perforating Co., 230 North Union St , Chicago. Ill.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.

Pipe Covering.
Keasby, R. A. 83 Warren St, New York.
Norristown Covering Co., Norristown, Pa.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Ameledema Oiliess Bearing Co, 149 West Berkley St, Wayne Junction, Pa.
Christiana Machine Co., Christiana, Pa.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co, Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.
Rusden Machine Co., Warren, R. I.
Saginaw Manufacturing Co., Saginaw, Mich.

Presses.
Boomer & Boschet Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia
Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Printers (Fabrics and Yarn.)
Capstick, John & Sons, Montville, N. J.
American Yarn Printing Works, Philadelphia.

Pulleys.
See Power Transmitting Machinery.

Pulley Covers.
Warren Mfg, Co., Chicago, Ill.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Quills.
Parker, Henry Co, Springfield, Vt.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Ring Travellers.
DeHaven Mfg Co, The, 50 Columbia Heights, Brooklyn, N. Y.
National Ring Traveller Co., Providence, R. I.
Morley Button Mfg. Co., Boston.

Roofing Asphalt.
Warren Bros. Co., 143 Federal St., Boston.

Roofing, Gravel, Slag and Composition.
Eastern Granite Roofing Co., Jersey City N. J.

Roofing Materials (Manufacturers).
Warren Bros. Co., 143 Federal St., Boston.

Rope Transmission.
American Mfg. Co., New York.
Holmesburg Banding Mfg. Co., Holmesburg, Pa.

Rove Traverse.
Rawlins, J. H, Chester, Pa.

Roving Cans.
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford, Mass.

Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.

Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I.

Schools.
American Correspondence School of Textile, New Bedford, Mass.
Lawrence Scientific School, Cambridge, Mass.
Lowell Textile School, Lowell, Mass.
New Bedford Textile School.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)
See under Perforated Metal.

Sewing Machines and Supplies.
American Machine Co., 420 Library St., Phila.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Excelsior Sewing Machine Co., Philadelphia.
Manufacturers' Supplies Co , 66 No. 4th St., Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Rusden Machine Co., Warren, R. I.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Union Button Sewing Mch. Co., 164 High St., Boston.
Wilcox & Gibbs S. M. Co., New York.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H., Paterson, N. J.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.

Knapp, C. H., Paterson, N. J.
Rusden Machine Co., Warren, R. I.

Sizing, Starch and Gums.
Stein, Hirsch & Co, 165 Duane St, New York.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.

Soaps.
India Alkali Works, Boston, Mass.

Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj'a, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Frames for Wool
Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.
Buckley, Benj'a. Son, Gun Mill, Paterson, N. J.

Spools. *See Bobbins, Spools Shuttles, Etc.*

Sprinklers.
International Sprinkler Co., Philadelphia, Pa.

Steam Boilers.
Babcock & Wilcox Co., The, 29 Cortland St., New York City.
Brown, C. H, & Co, Fitchburg, Mass.
Lee-Odlum Co., Memphis, Tenn.
Pendleton, Walter & Co., New York.

Steam Boiler Compound.
Straus & Co., 55 Broad St., New York.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Engines.
American Blower Co, Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Rentschler Co, Hamilton, O.
Pendleton, Walter & Co., New York.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. & Co., Boston.

Steam Surface Coverings.
Keasbey, Robert A., New York.
Norristown Covering Co., Norristown, Pa.

Steam Specialties.
Butterworth, H. W. Sons Co., Philadelphia.
Rusden Machine Co., Warren, R. I.
Jenkins Bros., New York.
Sturtevant Co., B. F., Boston.

Steam Valves.
Jenkins Bros., New York.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Cypress Lumber Co, Apalachicola, Fla.
Lee-Odlum Co., Memphis, Tenn.
Lewis, H. F. & Co., New Orleans, La.
Rusden Machine Co., Warren, R. I.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa.

Tapes, Braids and Edgings.
Cathcart, John, & Co, 115 Franklin St, N. Y.
Fleming & Chapin, Philadelphia.
Friedberger Mfg. Co, Germantown, Pa.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Weimar Bros, 1817 East York St, Phila, Pa.

Telephones.
Mianus Electric Co., Mianus, Conn.
Philadelphia Electric Construction Co., Philadelphia.
Plummer, F. O. 620 Atlantic Ave., Boston.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
Ameledema Oilless Bearing Co., Wayne, Junc., Phila. Pa.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1733 Barker St., Phila., Pa.

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Lee-Odlum Co., Memphis, Tenn.

Trimmers.
The American Machine Co., 420 Library St., Philadelphia.
Excelsior Sewing Machine Co, Philadelphia.

Turbines.
(See Water Wheels.)

Valves—Rubber.
Boston Belting Co., Boston, Mass.

Ventilating Apparatus.
Allington & Curtis Mfg. Co., Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston.
American Blower Co., Detroit, Mich.
Berry, A. Hun, 28 W. 1st St, Boston, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Mattern, Geo. 44 East 8th St., New York.
New England Ventilating & Heating Co, Providence. R. I.
New York Blower Co., New York.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Snediker & Carr, 139 No. 7th St, Phila, Pa.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Wall Whitening.
DeRonde, F. S. Co, 54 John St, New York City.
Moore, Benj. & Co, Brooklyn, N. Y.

Washers (Cloth).
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Hopkins, Machine Works, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co, Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Waste.
Kay, John J, Philadelphia, Pa.

Watchman's Clocks.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 127 Duane St., New York.
Philhdelphia Electric Construction Co., 1328 Chestnut St., Philadelphia.
Waggoner Watchman Clock Co., Grand Rapids, Mich.

Waterproof Floors.
Warren Bros. Co., 143 Federal St., Boston.

Water Wheels.
Bradway, C. P., W. Stafford, Ct.
Christiana Machine Co., Christiana, Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Bradway, C. P, West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St. Boston.

Winders. (**Back.**)
Taylor, Jas., 835 Arch St., Philadelphia.

Winders. (Hosiery.)

Universal Winding Co, 226 Devonshire St, Boston.

Wire Cloth.

Fraser & Chalmer, Chicago, Ill.

Wire Goods.

DeHaven Mfg. Co, The, 30 Columbia Heights, Brooklyn, N. Y.

Wood Pulleys.

Saginaw Manufacturing Co, Saginaw, Mich.

Wool Cleaning Compound.

India Alkali Works, Boston.

Wool Combing Machinery.

Crompton & Knowles Loom Works, Worcester, Mass.
Leigh, Evan A. 35 Mason Bldg., Boston.

Wool Extracts.

Garfield Woolen Co, Garfield, N. J.

Wool and Waste Dusters.

Atlas Foundry and Mch. Co., Newark, N. J.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen and Worsted Machinery.

Altemus, W. W, & Co, 2816 N. 4th St, Phila, Pa.
American Tool and Machine Co., Boston.
Arlington Mch. Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks., Newark, N.J.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Roy, B. S. & Son, Worcester, Mass.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Schofield, Geo. L., Philadelphia.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.

Wool, Hair and Noils.

Becker, Chas. W, Agt, Amsterdam, N. Y.
Fowles & Co, 106 Church St, Phila.

Wool Shoddies.

Becker, Chas. W, Agt, Amsterdam, N. Y
Garfield Woolen Co, Garfield, N. J.
Slack, Wm. H. H., & Bro, Springfield, Vt.

Wool Washing, Preparing and Drying Machinery.

Hunter, Jas. Machine Co., No. Adams, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Holmesburg Banding Co., Holmesburg, Pa.
Moore, C. & Co. 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Catlin & Co. New York and Boston.
Colchester Mills, 346 Broadway, New York.
Dexter Yarn Co., Pawtucket, R. I.
Eddy & Street, Providence, R. I.
Spring St., N. Y.
Eichmann & Sternberg, New York.
Germantown Spinning Co, Germantown, Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E. & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
New England Cotton Yarn Co, New Bedford, Mass.
Orswell Mills, Fitchburg, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Flax, Hemp, Jute and Ramie.

Fawcett, Hughes, 115 Franklin St., N. Y

Gassed Yarns.

Eichmann & Sternberg, New York.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
New England Cotton Yarn Co, New Bedford, Mass.

Glazed Yarns.

Indian Orchard Co., Indian Orchard, Mass.
Lorimers, Wm. H. & Sons Co., Philadelphia.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Cranston Worsted Mills, Bristol, R. I.
Fawcett, Hughes, 115 Franklin St., N. Y.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo. & Co, Phila, Pa.
Colchester Mills, 346 Broadway, New York.
Cranston Worsted Mills, Bristol, R. I.
Dexter Yarn Co., Pawtucket, R. I.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
Mitchell, James E, & Co, Phila. and Boston.
Monument Mills, Housatonic, Mass.
New England Cotton Yarn Co., New Bedford, Mass.
Orswell Mills, Fitchburg, Mass.
Platt Bros, Manayunk, Pa.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

Mercerized Yarns.

Indian Orchard Co., Indian Orchard, Mass.
Lorimer, Wm. H. & Sons Co, Philadelphia.
Montgomery, J. R. & Co., Windsor Locks, Conn.

Mohair Yarns.

Cranston Worsted Mills, Bristol, R. I.
Goff, D. & Sons, Pawtucket, R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

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Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, Camden, N. J.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket, R. I.
Platt Bros, Manayunk, Pa.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo. & Co, Phila, Pa
Campion, Richard, 17 Bank St., Philadelphia.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Goff, D. & Sons, Pawtucket, R. I.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
Pascasset Worsted Co., Thornton, R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Waverly Worsted Co, Main St. and Green Lane Manayunk, Pa.
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

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1653 **Supt.** of a small mill, or overseer of carding and spinning in a large mill. Has had seven years' experience as overseer and supt. in good mills. Is thoroughly posted on both gray and colored work. Has a thorough knowledge of designing, and understands all makes of machinery. Married, and good habits. At present employed as assistant superintendent in the South.

1673 **Cotton Supt., Carder, and Spinner.** Age 25; English; single. Large experience in English mills. Can take position at once. Has worked on all kinds of cotton machinery.

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189 **Cotton Superintendent** wants position in Northern mill. Has been in charge of Southern mills for 7 years. Previous experience in N. E. Is well known among mill men, and can furnish the best of references. Age 39; married.

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1682 **Supt. & Designer,** or would take a position as designer and asst. supt. in a good mill at $1500 per year. Has had 14 years' experience in woolen and worsted mills from pattern weaver, loom fixer, boss weaver, designer. Men's wear, wool and worsteds and dress goods. Best of references.

880 **Supt. or Assistant Supt. and Designer.** Over 25 years' experience as supt. and designer. Has designed and manufactured nearly all classes of goods made in a woolen mill, in wool and worsted, such as shawls, blankets, beavers, kerseys, cheviots, fancy cassimeres, overcoatings, worsted suitings, etc. 53 years old; married, with family. Would go West or nearly anywhere. Wants a mill where he can permanently settle and give them the benefit of his experience as a manufacturer. A first-class man.

1683 **Woolen Supt.** Large experience. Last mill where he was employed was for five years overseer and 15 as superintendent. A good man on flannels, sackings, skirtings, woolen dress goods and domestic woolen goods. Well up in weaving, dyeing, carding, etc., and has a general knowledge of all departments in a Western woolen mill. Englishman; married. Refers to past employers.

1674 **Supt.** or assistant in woolen mill. 10 years' experience on cassimeres, cloakings, etc. Well posted on shoddies. First-class references. Strictly temperate. Age 29; American; single.

1386 **Woolen Superintendent** or Boss Carder. Age 43; American. Familiar with the manufacture of all kinds of woolen goods, is well recommended, and can go immediately.

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1610 **Woolen Supt. or Dyer.** Large experience as dyer and assistant supt. on broadcloths, kerseys, dress goods and men's wear. Age 36; American, married.

1387 **Woolen Superintendent,** one who has had a thorough practical experience in setting up and operating woolen mills. Would take charge of small mill or finishing department in large mill. Now employed but wishes to change. Correspondence solicited.

WOOLEN CARDERS.

1696 **Carder,** or secondhand. Experienced on cassimeres, cloakings, blankets, shawls, jeans, and is familiar with Furbush, Bridesburg and Smith cards. Wants position in Western or Southern States. Can take place immediately. Age 30; American; single.

1701 **Boss Carder.** Age 39; English; married. Has had large experience as boss carder in Canadian mills, and has worked in New England mills, also held positions in England before coming to this country. He has worked on all kinds of wool, cotton, waste, mungo and shoddy mixes, cassimeres, dress goods, knit goods and blankets. Can take position at once. Excellent references.

1707 **Overseer of Carding.** Worked for 21 years in a woolen mill as boss carder, but through sickness was obliged to resign his position. Is now ready and wants a situation at once. Age 49; American; married. Wants $3 a day. Has worked on dress goods and flannels.

1643 **Woolen Carder.** Age 45; American; married. Has worked as overseer in first-class N. E. mills for the past 18 years. He is at present employed, but wishes to better himself. Could leave on a week's notice. Has worked on cassimeres, dress goods, flannels and underwear. A good manager of help and thoroughly competent and reliable.

COTTON CARDERS.

1734 **Boss Carder.** Age 47; Irish; married. Been in a mill all his life. Held position of secondhand for several years and for the past 20 years or more has held the position of boss carder. Prefers New York state. Cotton, wool, percentages, waste batches.

1751 **Carder and Spinner.** Can give first-class references as to character and ability. Has had twenty-one years' experience as overseer on both American and English systems of carding. An American; 45 years old. Has worked on fine and coarse, also colored cotton.

1759 **Boss Cotton Carder.** 25 years old. Has had 12 years' experience in a cotton carding room, and is well advanced in drafting and changing. Speaks French, Italian and English. Willing to go South or West. Refers to past employers.

1718 **Second-Hand in Cotton Card** Room. Has had 10 years' experience in N. E. mill. Understands all makes of machines. Can make all changes from 1 to 20 hank. Has taken course in cotton spinning at American Correspondence School of Textiles, New Bedford. First-class references. Would start at $2 00 a day. Young man and strictly temperate.

1720 **First Class Cotton Carder or** Supt. Has had the advantage of a great deal of experience in the various departments, and is thoroughly posted on all details of manufacturing and machinery. Would accept a position North or South. 36 years of age; American; married. Worked on print cloths, twills and sheetings. Has had charge of bleaching.

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WOOLEN SPINNERS.

1648 **Boss Woolen Spinner.** 47 years old. 28 years' experience. Worked on all kind of stock, from ¼ to 12 run. Temperate, steady, and refers to past employers. Will work for moderate salary. Not employed and could come at once. Experience on cassimeres, flannels, beavers, knit goods dress goods, blankets, shawls.

1732 **Boss Spinner.** Age 54; English; married. Has had a large experience as fixer and boss spinner in N. E. mills. Dress goods, beavers, kerseys, shoddy and shoddy mixes, blankets, jute, worsted tops and felts. Refers to past employers.

1595 **Overseer Worsted Spinning.** 10 years as overseer of spinning, twisting, reeling, dressing, spooling on worsted yarns Englishman; age 41, married. Now employed, but does not like section of country. A first-class man in every respect.

1543 **Woolen Spinner and Carder.** Has handled both departments together and separately. Will go South or West. Age 29; single.

1601 **Woolen Spinner,** or painter and glazer in any kind of mill. Age 31; Irish; married. Wants $10 50 per week. Has worked on cheviots, overcoatings, broadcloths, satinets, hosiery, yarns, etc.

1519 **Overseer of Woolen Spinning.** Age 31; married. Has worked on yarns from 1 run down to 5½. Some experience on shoddy. Will work for moderate salary.

COTTON SPINNERS.

1636 **Overseer Cotton Spinning, Spooling, Warping, Etc.** Has held position seven years of second-hand and has taken textile school courses. Having had unusual opportunities to learn, he feels competent to take position as overseer. Highly recommended by present employers.

1655 **Overseer of Cotton Spinning.** 42 years old; married. Experience as a spinner covers a period of 30 years in first-class N. E. mills. Has worked principally on fine yarns, 30's to 200's. Had some experience on coarse numbers. First-class references.

1364 **Mules or Frames.** 34 years old; married. Thoroughly understands all makes of English and Mason mules. Has set up machinery and been expert fixer. Wants good position as overseer of mule room, or would take charge of frames. Accept $3.50 per day. Best references.

1663 **Overseer Mule Room.** Eleven years' experience in Fall River mills, and for the past ten years overseer of mule room. Excellent reference from present employer. Age 44, married.

1698 **Overseer of Mules.** 34 years old; married; English. 10 years' experience, chiefly on English mules, on all grades of cotton yarn. Would like to get a large job.

1703 **Overseer Ring Spinning, Warping and Spooling.** Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married.

1690 **Cotton Mule Spinner.** Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with.

WOOLEN WEAVERS.

1645 **Overseer Weaving.** Age 30; married, American. Has worked in weave room since he was 17 years old, as weaver, fixer and secondhand of weaving, except for a short time was traveling salesman. Has worked on ladies' dress goods, men's fine worsted suitings, overcoatings, cloakings, etc., on Crompton & Knowles and Jacquard looms. Excellent references.

1712 **Second-Hand or Overseer of** Weaving. Age 29; American; single. Has some knowledge of designing. Has worked on fancy worsteds, cassimeres and cheviots. Wants $2.50 per day to start with. Is familiar with Crompton & Knowles machines.

1688 **Overseer of weaving** in large mill, designer in small mill, or assistant designer in a large mill. Age 38; German; single. Has worked on beavers, chinchillas, fine cassimeres, fine fancy worsteds, ladies' dress goods, army goods, union cassimeres and other classes of goods. Strictly temperate and industrious.

1482 **Weaver or Wool Sorter.** Has worked on cassimeres, cheviots, tricots, kerseys and cloakings. Good references.

1536 **Boss Weaver or Superintendent.** Age 43; married; American. Can run any department in woolen mill, having been in business for himself. Not at present employed. Can take position immediately.

1468 **First-Class Weaver** on fancy woolens, worsteds and meltons, cotton worsteds and shoddy goods. Can take overseer position after 6 days' notice. Has been loom fixer, boss and superintendent. Age 43. Crompton & Knowles looms.

COTTON WEAVERS.

1681 **Overseer or Secondhand of Cotton Weaving.** Has had long experience as loom fixer, secondhand and overseer, and can furnish excellent references. Has also had charge of cloth hall and drawing departments. With one mill was 15 years.

1687 **Overseer of Weaving.** Age 30; Scotch; married. Has worked on taffetas, grogran, satins, serges and grenadines, all kinds of plain and fancy cottons and lenos. Is familiar with Crompton & Knowles and Whitin looms. Wants $4 per day.

1668 **Overseer of Weaving.** Age 41; English; married. Has had large experience as loom fixer and secondhand of weaving, and is competent to take an overseer's job. Has worked on shirtings, sheetings, sateens, fancy lenos, and all grades of fine goods all the way from 2 to 25 harness.

1652 **Overseer Cotton Weaving.** Worked on about all kinds of cotton goods. Age 41, American, married. At present employed in the South, but wants to change for a healthier locality. Refers to present and past employers.

1708 **Overseer of Weaving.** Has had 15 years' experience on 12 different kinds of looms and most all kinds of cotton goods. Has worked in some of the largest mills in the South.

1738 **Overseer of Weaving. Drawing-in, Warping.** Slashing and all preparations. 14 years' experience in colored mill in Manchester, Eng., and two years in this country. Age 37; English; married. Has worked on sateens, drills, dress goods, zephyrs, turkish towels, and can pick out own pattern for weaving and drawing in. Understands the different makes of looms. Wants $3.00 per day.

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1084 **Overseer of Knitting and Finishing.** Age 33; married. Has just resigned position in the South on account of climate, and is ready to take place at once. Can furnish best of references.

1182 **Knitting Mill Supt.** A practical man, having had charge of each and every department in mill before becoming supt. Can furnish references as to character and ability. Wants to become associated with a reliable firm. Would take an interest in stock company starting a new mill. Is familiar with all makes of machinery and all classes of knit goods. Age 40; American; married.

1755 **Boss Knitter or Fixer.** Has worked on elderdowns, astrachans, cardigan jackets, balbriggans, rubber linings and fancy knit goods. Will not change for less than $3 a day.

598 **Boss Knitter or Supt.** Age 48; married. Is thoroughly familiar with the manufacture of all classes of seamless hosiery, and can take any position at short notice.

1722 **Supt. of Knitting.** Age 37; American; married. Long experience as overseer fits him for superintendent's position. Has also worked three years in machine shop, setting up knitting machines and making the different parts of same. Has worked on cotton, wool, merino and silk; plain and ribbed hosiery and underwear. First-class recommendations.

1747 **Overseer or Supt. Seamless Knitting,** or would take traveling position with some good reliable seamless machine company. Age 38; married; American.

DYERS.

1733 **Dyer.** Age 33; married; a Scotchman. Worked in Scotland, and has been over seven years in this country as secondhand for a large manufacturing concern, with whom he is at present, but desires to change to a position where he will have full charge. Has handled cotton yarn from 10's to 80's in warp and skein, also experienced on worsted and silk yarns. Can furnish references as to character and ability.

1730 **Dyer.** Overseer or would take good secondhand job. Age 24; English; single. Chain warps, filling, raw stock, underwear and hosiery yarn, print yarn, cop bleaching.

1664 **Boss Dyer.** Age 40; Scotch, married. 14 years' experience as boss dyer. 20 years in all at trade. Has worked on wool, cotton, ramie, worsted, shoddy and union waste dyeing for overcoatings, linings, tweeds, cassimeres, plaids, flannels, and ladies' wear, also on all wool and union piece dyes, hosiery, knit goods, yarns, slubbing. Is practically familiar with scouring, bleaching, carbonizing, speck dyeing and mill soap making.

1680 **First-class Cotton Dyer.** Has had charge of piece dying in several of the largest bleacheries and dye works in the country, to all of which he refers. Is thoroughly familiar with cotton piece dyeing, both fancy and fast blacks, and is also a first class yarn dyer and has a general knowledge of bleaching and finishing. Understands mercerizing. 39 years old; married; American. Habits and record first-class.

DESIGNERS.

1635 **Designer** on colored cotton dress goods, and shirtings, and fancy worsted dress goods, piece dye, jacquard work in cotton, silk filling, also lappets. Would not consider position paying less than $1200 a year. Is at present employed in one of the leading mills, making fancy cotton, and is an especially bright young man. Early training in Scotland. Has been in this country about four years

1621 **Designer or Assistant Supt.** on men's wear worsteds, cotton worsteds, overcoatings, cassimeres. High and low stock. Has been designer in several first-class mills. Age 34; married.

1672 **Designer, Overseer of Weaving,** or assistant supt. Age 26; English; single. Has worked in various mills in England and this country. Holds first honors diploma for weaving and designing (London City Guilds). Fancy worsteds, dress goods, colored and fancy cotton goods.

1599 **Assistant Designer.** A young man who is studying woolen and worsted designing would like an opportunity to get practical experience, and will accept very small wages. Has worked in mill for two years as weaver on Crompton & Knowles looms. Excellent references as to character.

1591 **Designer** on fancy worsteds, cotton worsteds, fancy cassimeres, tweeds, fancy back overcoatings, etc. Experience in first-class N. E. mills. Age 30. At present employed, but can accept position at once.

FINISHERS.

1526 **Foreman of Finishing Room,** Folding Packing, etc. Age 45; married; English. Has worked on white and colored goods and prints. Is acquainted with every kind of machinery used in his business. Has worked 11 years in this country. Can give good references.

1658 **Overseer Woolen Finishing.** Age 35; married. A number of years' experience as overseer in first-class N. E. mills. Worked principally on kerseys, meltons, unions and cassimeres, and is familiar with Curtis & Marble, Parks & Woolson and Cleveland machines. First-class references.

1716 **Finisher.** Age 29; English; married. Has worked as wet finisher, shearer, gigger, second-hand and overseer. Prefers a mill making cassimeres, worsteds, dress goods and face finished goods. A high grade of goods. Is familiar with all kinds of American and English finishing machinery, and can keep same in the best of repairs. Prefers Eastern States. Can take position at one week's notice. Best of references.

1692 **Cotton Finisher and Corduroy** Cutter. Age 31; English; married. Large experience in England and in this country. All classes of corduroys and velvets, cutting, etc., singeing and finishing of cords. Can furnish excellent references.

1729 **Overseer of Finishing.** Age 46 26 years' experience as overseer on all kinds of woolen and union goods Thoroughly posted on finishing low to medium grade of wool warp and cotton warp fancy cassimeres, overcoatings, cloakings, worsted suitings, also steam finished goods. Good references from present employers.

1761 **Finisher.** Is 27 years old, and has worked 12 years' in finishing room, and three years as overseer. Fancy cassimeres, cheviots, meltons, broadcloth and mixes. Can give good references, and will go anywhere. Wants, at least, $2.50 per day.

MISCELLANEOUS.

1731 **Young Man of 32 desires to go** to Japan. Is temperate. Been twenty years in cotton mill, and has had experience on many kinds of looms, including Draper. Has best of references. Holding a good position in mill now.

1744 **Fixer.** Age 24; American; single. Is familiar with Boss, Invincible, McMichael & Wildman, Brinton, Denny and Victor machines. Wants $15 a week.

1740 **Assistant Supt. and Designer,** overseer of weaving, designer, or both. Age 29; Scotch-American; married. Worked in Scotland and 5 years in this country. Fancy white and colored cotton goods, lenos, lappets, welts, dimities, sateens, Jacquard, towels and handkerchiefs.

1749 **Fixer or Boss Knitter** wishes position. Eight years' experience on knitting machinery. Experienced on Standard, Mayo and Hepworth machines. Will accept position in any state.

1583 **Cloth Room Overseer.** A young man having good experience as overseer in plain and fancy mills desires to change. Has worked on nearly all classes of cotton goods, and is recommended as a first-class figurer and good manager of help. Can take charge of cloth department and shipping where both positions are combined, or would accept position as office assistant. American; married.

1711 **Mill Engineer and Draughtsman.** American; married. Would take up other responsible duties in connection with engineering work. References of the highest character, and salary expected quite reasonable.

1713 **Foreman of Picker Room, or** Painter for some mill and weaver in winter or any other winter work. Wants employment year around. Is an all around man in woolen mill. Has worked on beavers, blankets and fancy dress goods. Wants $2 per day to start.

1726 **Superintendent** broad silks from time of leaving weave room till ready for consumer, piece dye cotton and silk mixtures included, or will accept overseership in any department connected with above. 35 years old; American; married. Is familiar with most all machinery used in this branch.

1685 **Boss Dresser or Assistant Designer.** Has taken a thorough course in designing, and is well up in calculations and in the making of fancy men's wear goods of all kinds. Has worked in Scotland and three years in this country. His knowledge of yarn calculations and practical experience as dresser tender makes him well fitted to fill a position as boss dresser and to run a room in an up to date and efficient manner, or to fill a position as designer or assistant.

1695 A young man would like to obtain a position in some Southern cotton mill as assistant supt., or some such position, where he would have an opportunity to learn the business thoroughly. Has theoretical and some practical knowledge.

1746 **Overseer Warping and Dressing,** or weaving, warping and dressing. Has worked on woolens and fancy worsteds. Is familiar with Davis & Furber dressers; Draper, Phenix and Lowell Machine Shop warpers; English plain and Crompton looms. Wants $3 a day.

1762 **Chemist.** Age 23; American. Wants a position in dye works, print works or bleachery. $15 a week to start on. Excellent references.

TO LET.

Third and Fourth floors with power and light, separate stairway, power elevator in the new fire proof constructed mill just finished for the Allentown Reed, Harness & Mill Supply Co., centrally located, adjoining Lehigh Valley Depot. 7,500 square feet on each floor. Apply, ALLENTOWN REED, HARNESS & MILL SUPPLY CO., Allentown, Penn.

TO LET.

Exceptional opportunity. Three floors and basement of the new addition to the "Hall" Mill, Fulton Street, about 6,500 square feet on each floor, with heat, power and electric light. Best up-to-date fire-proof mill construction. Apply, I. A. HALL, 30 to 36 Hamilton Avenue, Paterson, N. J.

Superior Locations for all kinds of Textile Mills

May be had at points on Southern Railway

Steady and remarkable success has attended the mills located on the Southern. It is the great Textile Line of the South. Mill Men and Mill Investors should investigate the advantages our districts afford.

We have now a number of excellent points for new Cotton Mills, or for Knitting Mills, where local capital will join with that from the North in new enterprises. If you are interested, write us.

M. V. RICHARDS,
Land and Industrial Agent, Southern Railway,
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Good Secondhand Electrical Machinery.

Dynamos, Motors, Boilers, Engines, Arc Lamps, Etc. Practically just as good and serviceable as new. We are selling amongst the largest and most enterprising concerns in the country. You can get guaranteed machinery for less than half price. We have a large stock, everything thoroughly overhauled and tested and fully warranted. Write us if you want to buy or exchange, and get our estimate.

2-100 h. p tubular boilers at	$350 ea.
4-80 " " " "	290 "
1-700 " Berryman feed water heater	275 "
1-50 light T H. arc dynamo	295 "
1-30 K. W. 110 volt Incandescent dynamo	295 "

Also many other bargains.

Am. Electric Supply & Construction Co.
27 Thames Street, - - New York City.

1630 Boss Carder or Comber. 10 years' experience as second hand of carding and combing. Would like to secure an overseer's position at $3 a day. Has worked on all grades of foreign and domestic wools and is highly recommended by present and past employers. Englishman; age 25, married.

Superintendent Wanted for Cotton Bag Factory.

A thoroughly well-posted superintendent is wanted who understands every branch of the manufacture of seamless cotton bags, to take charge of a plant of about 6,000 spindles and 100 bag looms. Must furnish the best of references and prove his ability in this special line. Address, in confidence, A.G.T., care of TEXTILE WORLD.

WANTED.

Bleacher that understands bleaching and finishing of Marsailles crochet bed spreads. Must understand the finishing part thoroughly. State wages expected. Address, HUNT, care of Textile World.

WANTED.

A Drying Cylinder, 5 ft. Diameter, 36 to 40 in. wide, with gear attached, and to stand 15 to 20 lbs. pressure, with or without frame. Address P. O. Box 1806, Paterson, N. J.

REED MAKER WANTED.

Experienced reed maker who can repair and build reeds, and also harnesses if necessary, is wanted in a silk plush mill. Address, with full particulars, V. S., care of Textile World.

1626 Dyer and Finisher, with experience on plushes, dress goods, mohair and worsted genapped yarns, cotton and woolen yarns, raw stock. At present employed, but will consider position paying $3 a day.

1427 Second Hand Cotton Piece Dyer. Age 38. Married. Worked on canton flannels, sateens, drills, ducks and all kinds cotton piece goods. Was 12 years in one mill as second hand. At present employed but can leave at once. Well recommended.

1644 Overseer Aniline Black and Turkey Red Dyer. Has had ten years' experience as secondhand in mill where he now is, but wishes to change to better himself. Can take a position at once. Has worked on sateens, cambrics and linings of all kinds. Age 24; English, single.

1606 Woolen Supt. 24 years' experience as supt. and manager. Several years manager of his own plant. At present out of position owing to consolidation. Would make a successful manager of a moderate sized plant, making plain or fancy cassimeres, doeskins or felt goods. Best of references.

1677 Woolen Carder. Worked on cotton, wool and shoddy, also worsteds. Age 33; American; married. Has had about nine years' experience. At present employed as overseer, but wishes a larger salary. Worked on all different makes of machinery. Excellent references.

1561 Boss Dyer, with long experience on all kinds of worsted, serges, cloakings, flannels, repellants, kerseys, also all wool, cotton and silk. Best of references. Age 35; married.

Textile Instruction By Mail.

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Universally recognized as the

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SEVENTEENTH YEAR.

Oldest in America.
Most Complete in the World.

Endorsed by leading Educators and Manufacturers.

COTTON, WOOL, WORSTED AND SILK.

Instruction given in Designing, Weaving, Carding, Spinning, Chemistry, Dyeing and Finishing.

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Day classes open October 1st, 1900; Evening Classes open Oct. 8th, 1900.

Special Courses in Textile Chemistry and Dyeing.

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LOWELL Textile School

Thoroughly practical instruction given on

New Machinery in Every Branch of

Textile Manufacturing.

The most complete Textile School in America.

New and Complete Textile Dyeing Laboratory now Open.

Send for Catalogue to

WM. W. CROSBY, Principal

LOWELL MASS.

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

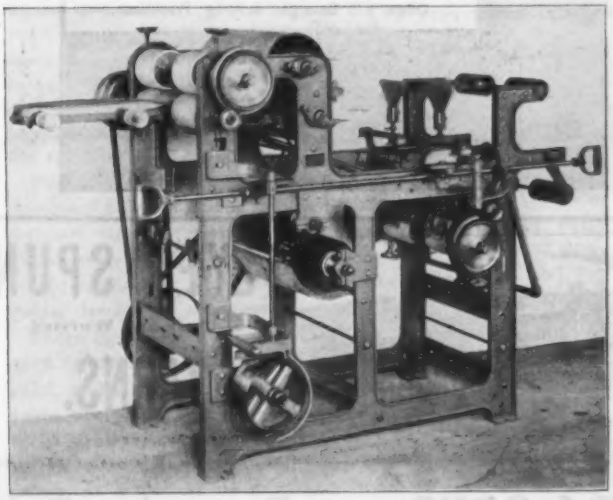
UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

226 Devonshire St., - Boston, Mass.

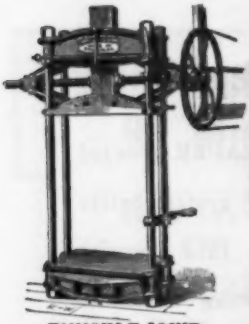
SINGEING MACHINE

For All Kinds of Elastic Fabrics.



Singes both sides of web at once.
Webs can be run slack or stretched, as required.
Revolving brushes clean fabric before and after singeing.
Impossible to burn the web while getting machine in motion or stopping it.
Burners always give a clean, blue flame.
No air compressor or blower needed.
Large production and best results.
Also singeing machines for all kinds and widths of goods, from yarns to piece goods 72 inch wide.
Write for prices.

C. H. KNAPP, Wait and Rye Streets, **Paterson, N. J.**



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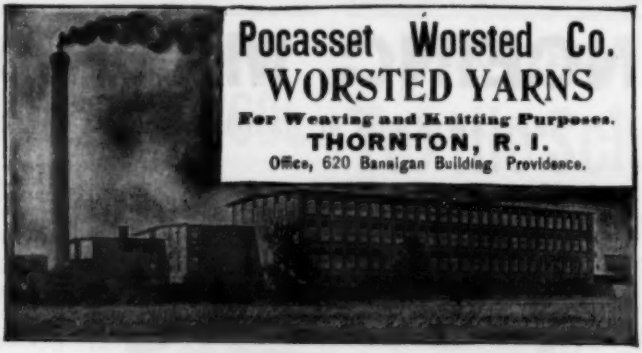
ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS

TO SPOOL FROM COP, SKEIN, OR BOBBIN.



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WORSTED YARNS

For Weaving and Knitting Purposes.

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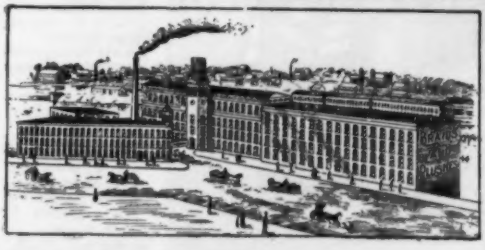

FLYER SPUN

Mohair and Worsted

YARNS.

Mohair Plushes,

Worsted and Cotton Braids.

D. COFF & SONS, Pawtucket, R. I.

ESTABLISHED 1861.

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn: Spinners are running fairly well. Knitters of white cop yarn are buying only in moderate quantities, as there is a feeling that even if a short crop does result, the war in China and the India trouble will more than offset any crop condition, and hence no advance in cotton need be considered.

Some orders have been placed, but the knitters are working carefully. The new spinning mills of the knitters are running.

Underwear manufacturers are all busy, and will later place good sized orders, but are anxious to secure bottom prices. The great reduction on Combed Egyptian yarn has the result of making manufacturers cautious. Of course, the price on this yarn is not as low as last year, but the price of yarn is low enough to enable manufacturers to hold the business at an advance of from 50 to 75 cents per dozen on underwear.

The hosiery manufacturers are busy and orders for yarn are being placed at the lower rates. New orders, however, are coming slowly from the jobbers. There is much Southern yarn being used to replace Eastern yarn, and the Southern spinners may soon have representatives in the East selling this yarn direct.

The new schedule of prices of the Southern Hosiery Yarn Spinners is as follows: Sizes to 8s, 15½c.; 9s to 10s, 16c.; above 10s and up to 24s, a rise of ¼c. a number; above 24s and up to 20s, a rise of ½c. a number.

There is considerable stained cotton yarn being sold to imitate Egyptian yarn, and garments made from these yarns are being sold at a lower price than regular Egyptian goods and this makes the variation in some of the prices, at which these garments are being offered.

The demand for 2/20s, 2/30s and 2/40s cotton yarn is still on, although prices have been materially reduced. This class of yarn will continue in demand for the present. The shipment of cotton goods to China was stopped July 1st, and the cotton industry in England is in a critical condition.

Worsted Yarn: Worsted spinners are hustling for orders. Everything depends on the way that light weight goods sell during the next two or three weeks. At present most of the spinners are out of orders, from all sections, from the spinning districts in Philadelphia to the large spinning mills of the East.

Several large spinning mills, that have for the last six or eight months been spinning for the Woolen Trust, find that now further contracts in that direction are not forthcoming, judging from the fact that one of the largest mills spinning for the trust is discharging help, and telling operatives that their services will no longer be required, and that it is not known when the mill will start again.

The mills in Lawrence have been running slack. The Washington Mills were closed for four weeks. Other mills in that vicinity have been running short time for sometime or shut down.

The manufacturers of bunting state that the present, which is the beginning of a Presidential campaign is usually their busiest time, and, although later they will have orders, yet at present few of their goods are being sold, and consequently they are not inclined to place orders for yarns or tops.

The manufacturers, who are given exceptionally low values on yarns, are buying them, believing that at the prices quoted they are making no mistake, as the prices are fully as low as those before the advance in wool and yarn one year ago. The prices given are quoted by not more than one

Frank E. Patterson, Prest. Oscar W. Wood,

GERMANTOWN SPINNING COMPANY INCORPORATED GERMANTOWN JAN. 9TH 1890

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

W. Warren Thread Works,

SPOOL COTTON

on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use

on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns

on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

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Incorporated 1899.

AMERICAN COTTON·YARN·EXCHANGE

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AMERICAN

Cotton Yarn Exchange

COMBED AND CARDED COTTON YARNS

From Northern and Southern Mills.

American, Egyptian, Peruvian and Sea Islands.

ARNOLD B. SANFORD, Pres. and Gen. Mgr.

67 Chauncy St.,

BOSTON, - - MASS.

Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, **Philadelphia, Pa.**

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
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Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
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JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelphia, Pa.
74-78 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40s and above.
AND
FITCHBURG, MASS. **WARPS**

E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns,
Double and Twist Yarns for
the Weaving Trade.
PAWTUCKET, - R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

Eddy & Street,
COTTON, **YARNS** WORSTED,
WOOLEN, AND SPUN SILK.
BRAIDS
PROVIDENCE, R. I.

or two spinners, and are evidently placed with the idea of raising money, rather than making a profit, although it may be that China wool is being used, as it is known that some tops have been gotten up with this wool, which has produced a very good yarn but, whatever it is, there seems to be a mystery about the whole transaction. We have reference to a low 3/8 blood yarn which is being sold in 2/26 and 2/32s for 65 and 67½ cents. There are also some sales of tops being made in ¼ to ⅜ blood quality.

The whole situation is dependent upon the next 3 or 4 weeks. If, as many believe, the clothiers at the last light weight season overbought, believing that their last chance to purchase goods had arrived, they naturally would have their shelves filled with light weight cloth carried over from last season, and therefore there will be neither the necessity nor desire on their part to buy more than enough cloth to freshen up their stocks.

Many mills carried over from last light weight season, thousands of yards of cloth, which were thrown back on their hands through cancellation, and these holdings must be "dumped" somewhere. We know at the beginning of this season of large sales of carried over light weights, which showed a heavy loss.

We think that while the coming light weight season will not be a boom, yet there will be a steady demand for cloth at prices, which will not show much advance over the last light weight season. The styles in demand will call for yarns ranging from ¼ to ⅜ blood quality, and will be largely a demand for serges and cheviots. The fancy worsteds, which will sell most, will be those at a fairly low price imitating the higher priced fabrics.

The much talked of Worsted Trust, it is now stated, is likely to become an accomplished fact. It is said that the 15 or 16 mills, for which options have been secured, which options will run out on the first of August, are to

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

WILLIAM FIRTH, PRESIDENT. FRANK B. COMINS, TREASURER.

AMERICAN MOISTENING COMPANY,

150 Devonshire St., Boston, Mass.

The "Drosophore" and "Vortex" Humidifiers.

Legal proceedings will at once be taken against infringers and users of infringements.

WE HAVE, WITH INSTALLATIONS IN HAND, ORDERS FOR OVER 2,000 HUMIDIFIERS.

COTTON YARNS

from 2s to 26s single and ply.
SPECIALTY—FIRE HOSE CORD and YARNS put up on tubes wound on Universal System.

WHITTIER COTTON MILLS, - - - - - LOWELL, MASS.

HOME BLEACH AND DYE WORKS,

PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

PAWTUCKET, R. I.

INDIAN ORCHARD COMPANY,

Indian Orchard, Mass.

Manufacturers of - - - -

COTTON WARPS AND YARNS

In gray and all colors, single or in any twist.

COLORED COTTON

Machined, Carded or in Roving.

NOVELTY YARNS

In Cotton, Mercirized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.
We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.
We use a uniform grade of long stapled cotton in all our manufacture.

have those options extended, and an endeavor is being made to get options on other spinning plants. This movement has become more popular lately.

The French system mills are running on old orders secured last November or December. This yarn was largely bought at that time, and the spinners, whose orders are either run out, or new mills, which are waiting for an opportunity to get some new business, will probably have to wait until October or November before more large orders are placed. The prospect of a steady business during the next 3 or 4 months is a good one, which will become better as the end of the year is neared, but merchants, spinners or weavers, who are looking for a boom, and who expect business will come to them without solicitation on their part, are doomed to disappointment.

We quote prices as follows:

2/40s Australian, $1.12½.
2/40s good half-blood, 90c.
2/40s ¾-blood, 85c.
2/30s ¾-blood, 80c.
2/26s ¼-blood, 70 to 75c.

Woolen Yarn: Spinners continue busy with the prospect of having more work on hand than can be well taken care of. The spinner is being well taken care of by the knitters. The weavers, since the light weight season has started, are buying more cautiously, and will withhold orders until it is known just what the requirements of the light weight season are to be.

Although at this writing the light weight season, requiring woolen yarns, has not developed, it is certain that buyers of cloth, who the last light weight season purchased 30,000 yards, will not, it is stated, purchase over 5000 yards, until the trade has developed. It is not so much that jobbers own light weights, as that large quantities of heavy weights have been carried over, and have locked up much working capital. It is not pleasant to write bear market reports, but a report to be of any service must be truthful.

There is no doubt that among the smaller mills there is a greater demand for both yarn and wool. The larger mills are not buying, and if they do buy, it will be stocks which

DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted. Cable Cords and Twines.
PAWTUCKET, - R. I.

COLCHESTER MILLS,
Thos. F. Patterson, Treas.
Spinners of
COTTON YARNS.
Sales in charge of
A. D. SALKELD,
908 & 909 New York Life Building,
346 Broadway, New York.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Mercerized, Turkey Red, Gassed } Cotton Yarns.
Jacquard and Harness Twines.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

COP
Yarn Account
WANTED.

A selling agent having a well established trade among Knitting manufacturers to whom he sells woolen and worsted yarns wants a cotton yarn account. Mule spun cop yarns 10s to 20s. Spinner bills direct to customer. 1½% commission to agent, who pays all expenses. Address,

COP YARN,
Care of Textile World,
Boston, Mass.

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White, Colored, Fancy and Double and Twist, **COTTON WARPS**
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MERCERIZERS AND DYERS.
DEALERS IN
MERCERIZED COTTON YARNS
All Numbers Up to 140. 2 Ply in Combed Peelers, Egyptians, & Sea Islands . . . . .
Ontario & Lawrence Sts.,
Philadelphia, Pa.

they do not own. They bought last heavy weight season, anticipating a call for fine cloth, which did not materialize, so that, if the present season calls for coarse wool, it will be bought on the market. The knitters and manufacturers, who are buying, purchase cautiously, and unless concessions are made, will reduce amounts to be purchased, rather than take the whole quantity without a material reduction.

The condition of the London wool sales will not be amiss at this time. These sales opened July 3d, and showed at the opening a reduction of 10 to 15 per cent. This was gained before the close of the sales, although to bring about this recovery 160,000 bales were withdrawn from the market, and one sale of the series was omitted, making the next sale, Oct. 6th. Australian Merino can be bought on a clean basis landed, for from 70 to 75 cents, according to quality, and Australian lambs about 75 cents per pound. Australian thread waste, 55 cents. America purchased at the last sales 2000 bales of cross bred wool. There has been much dissatisfaction found at the manner in which the wool sales are being manipulated in London, in order that the price of wool be maintained.

Whatever may be the condition in Europe, it should not affect us materially here, as our tariff protects us from the European surplus. The other side of this question is that outside of 3 or 4 wool houses, wool has not been so scarce in Boston for years. Some of the large wool scouring establishments are a good indication of the way wool stands. Some of the largest, which usually carry on storage for outside parties 20 to 40,000 bags, have been reduced to 10,000 to 20,000 bags. This is to be a consignment year, and wool will be held for a market, and fair price.

Manufacturers are anxious to have the price of wool maintained, and are doing all in their power to have prices "keep up." An advance of ½ to 1 cent per pound in grease wool would be a welcome fact, as it would start trade, and force manufacturers in the market to buy round lots, and would stop the hand to mouth buying on light weights.

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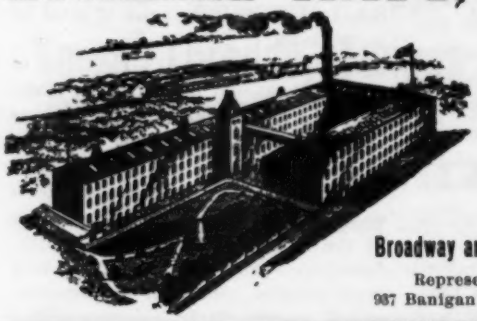

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All Numbers to 60s.

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MANUFACTURERS OF

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Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

Philadelphia Cotton Yarn Market.

There has been very little change in the market situation during the last month. The volume of business has probably somewhat decreased, although some mills are sold up very full, and have no need to take new orders for a long time to come. Prices have been cut in both weaving and hosiery yarns, but the knitters have kept up their business in better volume than the weavers.

The recent rise in cotton stiffened yarn up considerably, especially in those grades which had been battered down to an extremely low figure.

We quote prices about as follows:

Southern Cones:—

5s and 6s	14½ to 15
7s and 8s	15 to 15½
10s	15½ to 16½
12s	16½ to 17
14s	17
16s	17 to 17½
18s	17½ to 18
20s	18 to 19
22s	18½ to 19½
24s	19 to 20
26s	19½ to 20½
30s	21 to 22

New England list prices:—

10s	18¾
20s	22½
30s	27½

Silver and Jaeger yarn 2 cents per pound advance.

Mock Egyptian, 2 to 3 cents advance.

Southern Skein:—

8/1	13½ to 14
10/1	13½ to 14½
12/1	14 to 14½
14s	14 to 14½
16s	14½ to 15½
20s	15½ to 16
22s	16 to 17
26s	19

Good soft qualities at usual advance.

Warps (single):—

14s	15½
16s	16
18s	16 to 16½
20s	16½
26s	17½ to 18

Skein:—

8/3	13½ to 14
12/2	14½
14/2	15
20/2	17 to 17½
30/2	20 to 21
40/2	30

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
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Sanitary and Fancy Mixes
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of our popularity is no secret to our customers Experience has taught them that we give them better work and better service than they can get elsewhere.

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WORKS: Taylor, Emerald and Adams St., Kensington, Philadelphia, Pa.

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14s	16
16s	16½ to 17
20s	17½ to 18
30s	21 to 22
40s	30 to 31

Woolen, worsted and merino, also wool spun yarn very dull. Prices very much in buyers favor.

Washington the Next Meeting Place.

The 69th meeting of the New England Cotton Manufacturers' Association will be held at Washington, on October 17th and 18th. While the arrangements are not fully completed, yet it is promised to be a meeting of unusual interest, while it is a favorable time to see the numerous attractions.

—"Battik" is the name given by the natives of the Dutch East Indies to a decoration which they apply to their clothing. A piece of linen is taken, and all kinds of designs are outlined upon it with a pencil. When the design is completed, the ornamented parts of the fabric are covered with a liquid which possesses the quality of stiffening after being applied. The parts not ornamented are dyed the color desired. After the entire fabric has been ornamented in this manner, it is boiled in hot water so as to take the hard stuff out of the battik. The dyed parts will then hold the dye, and the battik is ready. People at the Hague were the first to introduce battik into Europe. It is made on linen, silk, velvet, and leather, and it is exported to all the principal cities of Europe.

—Badly oiled machinery, obstructions in the journal boxes, wheel gearing too much toothed, bad quality of leather, bad couplings and bad sewing, oil spilt upon pulleys, and belts running too tight, are some of the main causes of the destruction of belts.

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ALIZARINE RED, PASTE AND POWDER.

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
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Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

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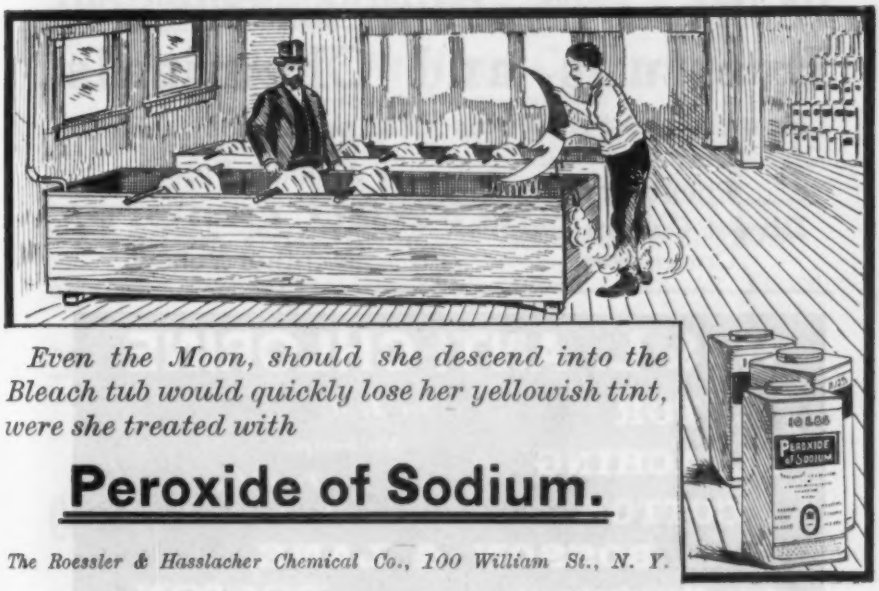

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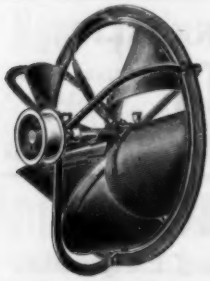

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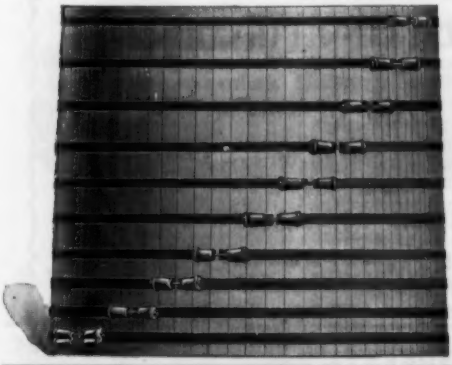

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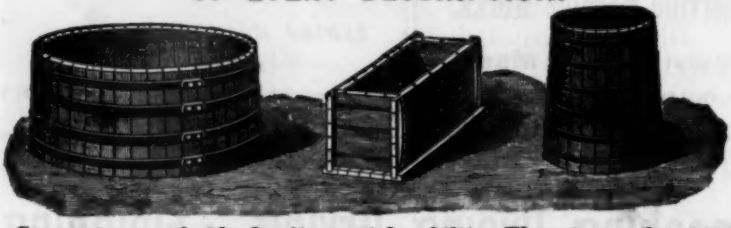

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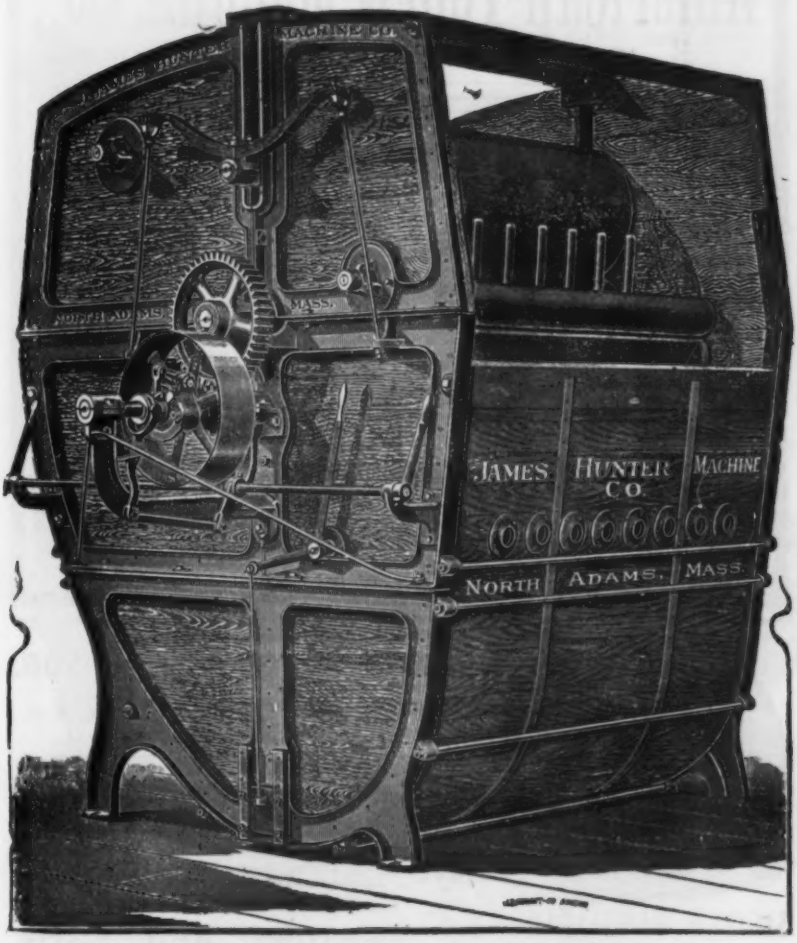

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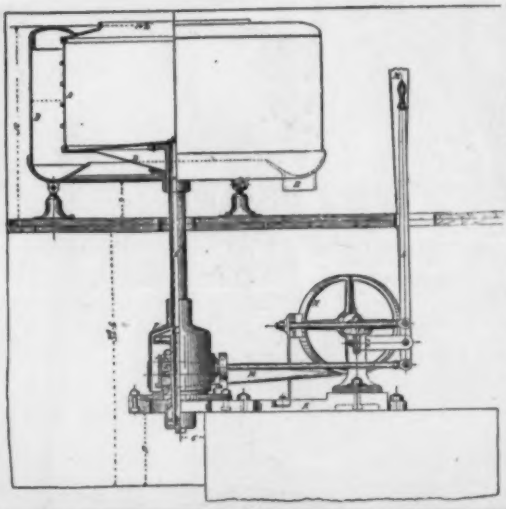

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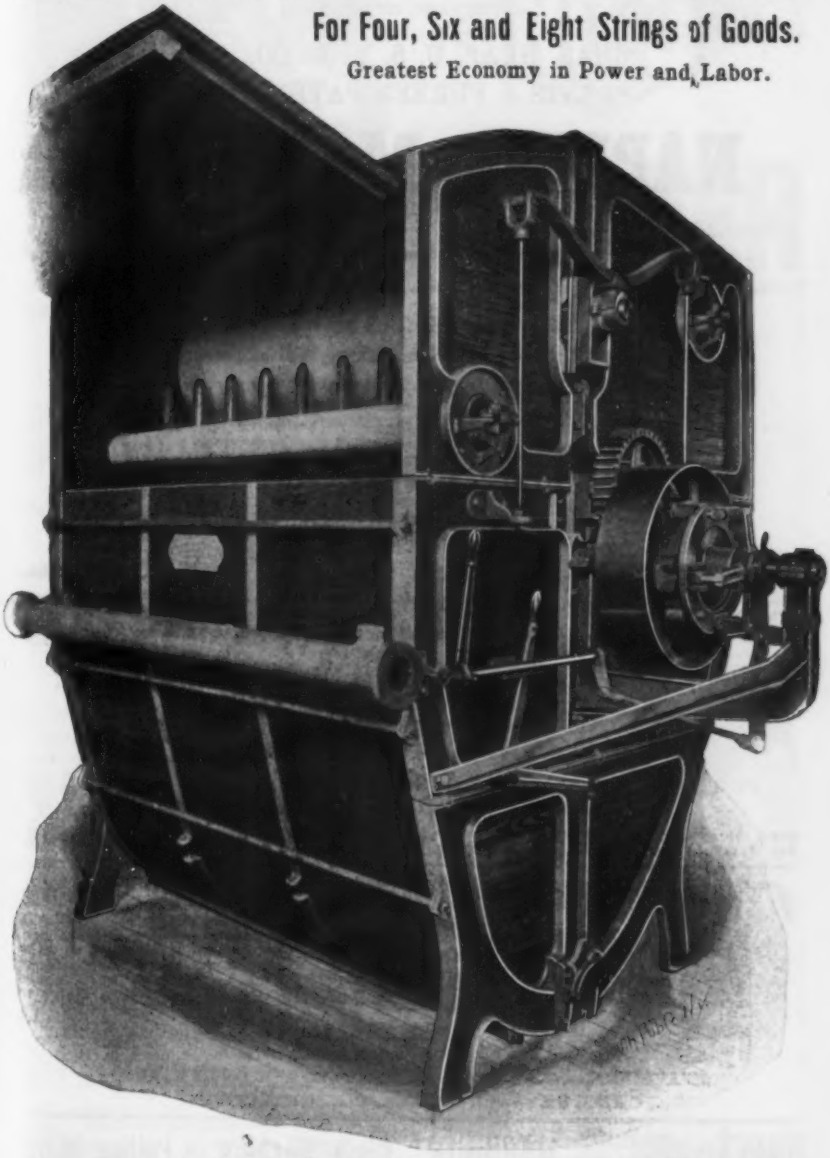

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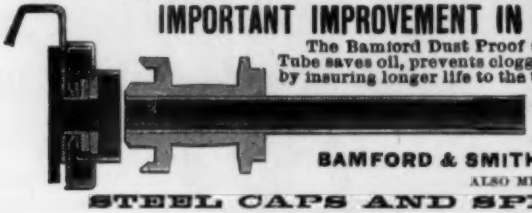

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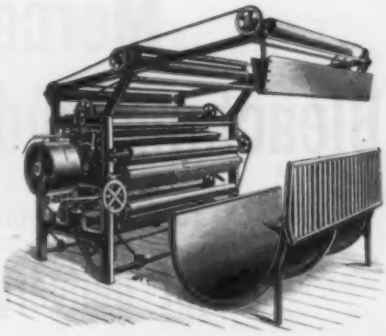

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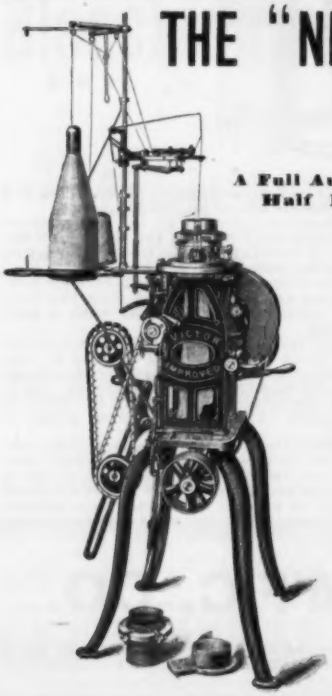

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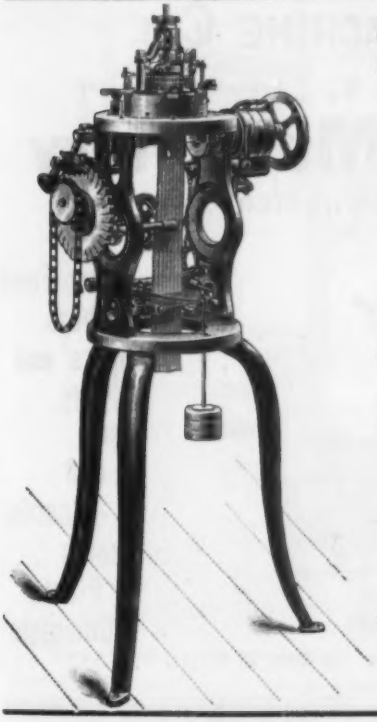

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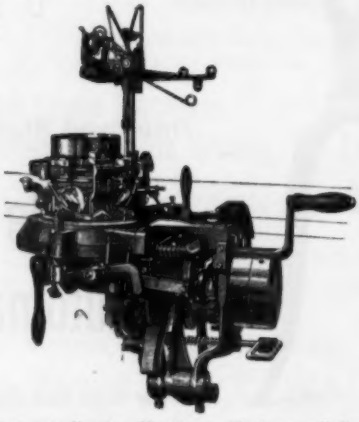

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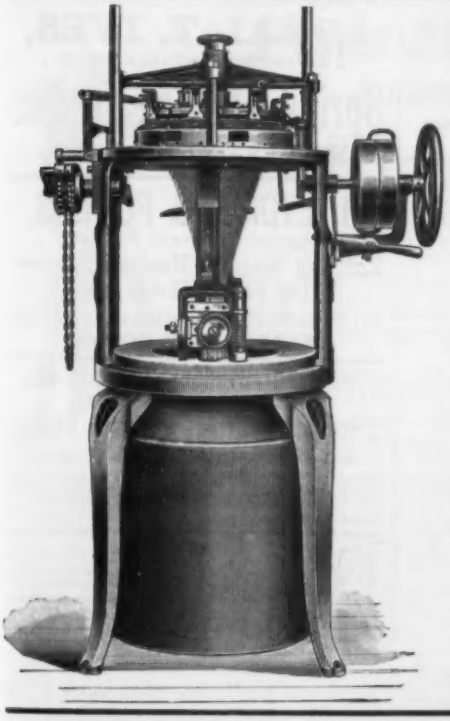

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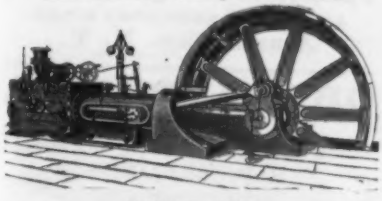

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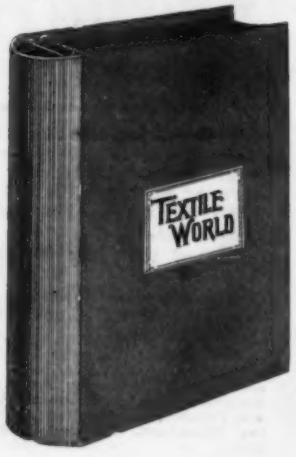

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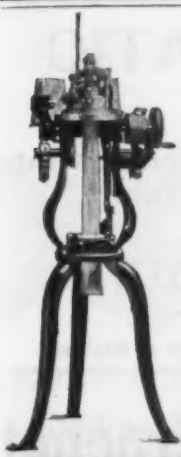

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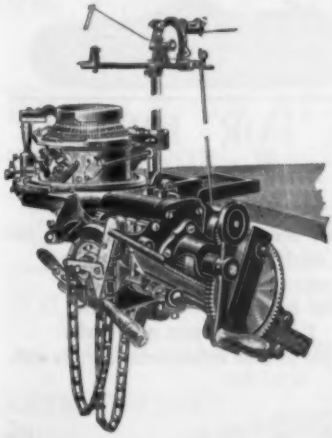

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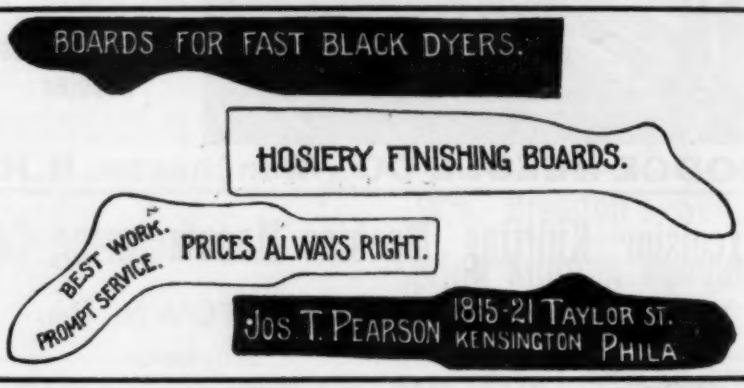

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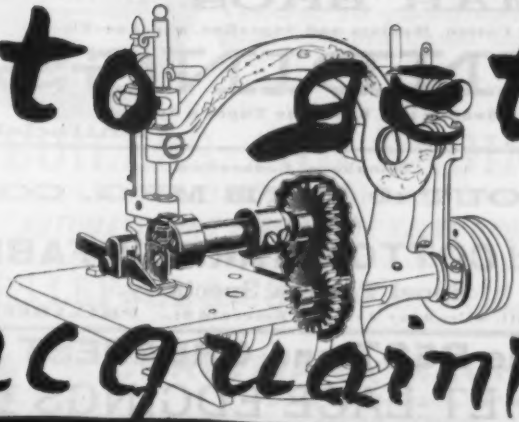

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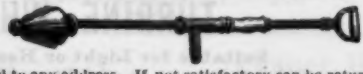

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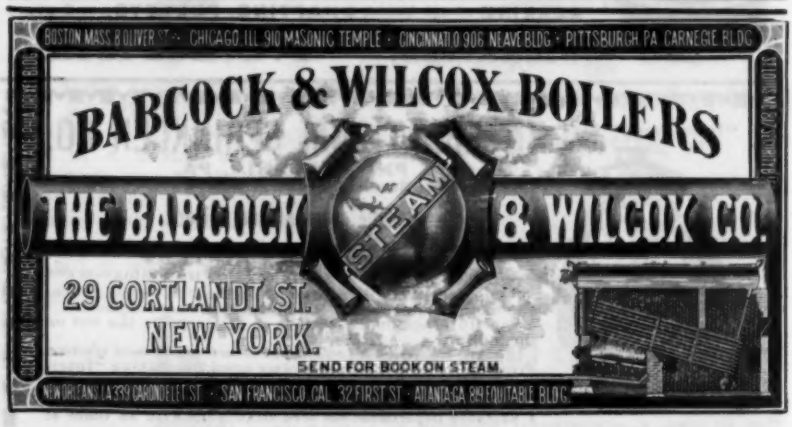
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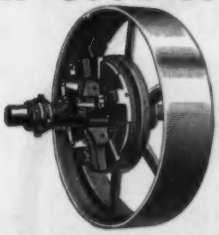

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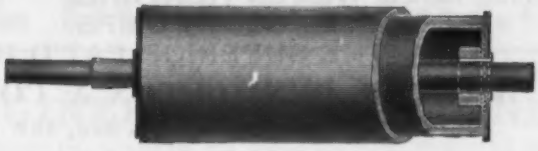

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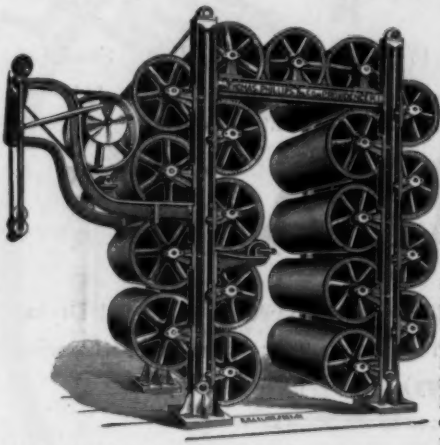

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